olivetti

Servizio Tecnico Assistenza Clienti

LOGOS 270

PART MOVEMENTS AND ADJUSTMENTS

OLIVETTI

Customer Engineering Service

LOGOS 270

PART MOVEMENTS AND ADJUSTMENTS

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INDEX

GUIDE TO INTERPRET THE SYMBOLS . . . . page 3

Guide to interpret the part movement figures . . . . page 4
Guide to interpret the adjustment figures . . . . page 8

PART MOVEMENTS AND ADJUSTMENTS

Introduction . . . . page 15

Section A - MOTOR UNIT

Closing of the power circuit . . . . page A - 3
Mechanical power distribution . . . . page A - 7

Section B - KEYBOARD UNIT

Introduction . . . . page B - 2
Principle of the keyboard unit operation . . . . page B - 5
Entry servo clutch . . . . page B-11
Entry mechanism . . . . page B-15
Restoring of the entry mechanism . . . . page B-21
- Restoring of the "Coding Bar Slide" to its upward position . . . . page B-22
- Disengagement of the "Coding Bar Slide" from the setting bails . . . . page B-23
- Disengagement of the entry servo clutch . . . . page B-24
Coding validation (AK). . . . . page B-27
Restoring of the validation mechanism . . . . page B-32
Locking of the coding bars . . . . page B-35

Adjusting the entry servo clutch engagement . . . . page B-40
Adjusting the angular position of the rear setting bail . . . . page B-41
Adjusting the angular position of the front setting bail . . . . page B-42
Adjusting the amount of travel of the restoring bail . . . . page B-43
Adjusting the coding bars lock mechanism . . . . page B-44
Adjusting the angular position of the AK Reedswitch screen . . . . page B-46

Section C - TIME SWITCH

Foreword . . . . page C - 3

Adjusting the time switch . . . . page C - 6

Section D - KEYBOARD LOCKS

Locking of the keyboard by a double key depression . . . . page D - 3
Particularity of the CONSTANT key . . . . page D-11
Keyboard release . . . . page D-15
Locking of the keyboard during the calculation . . . . page D-19

Adjusting the double entry keyboard lock . . . . page D-22
Adjusting the keyboard lock during the operation . . . . page D-25

Section E - PRINTING UNIT

Introduction . . . . page E - 3
Principles of operation of the printing unit . . . . page E - 5
Carriage movement . . . . page E-11

Carriage return . . . . page E-17
Stopping of the carriage at the maximum leftward travel . . . . page E-19
Closing of the AW microswitch . . . . page E-21
Firing of the hammer . . . . page E-25

Adjusting the angular position of the carriage engagement controlling bridge . . . . page E-28
Adjusting the amount of printer solenoid control . . . . page E-30
Adjusting the engagement of the carriage movement rack . . . . page E-31
Adjusting the timing between the character drum and the carriage movement rack . . . . page E-32
Adjusting the maximum travel of the carriage . . . . page E-34
Adjusting the timing between the strobe wheel and the character drum . . . . page E-35
Adjusting the position of the pick up coil . . . . page E-36
Adjusting the AW microswitch . . . . page E-37
Adjusting the rest position of the fire hammer . . . . page E-39
Adjusting the striking power of the fire hammer . . . . page E-40

Section F - RIBBON FEED, RIBBON REVERSE UNIT

Ribbon feed . . . . page F - 3
Ribbon reverse . . . . page F - 7

Adjusting the amount of ribbon feed . . . . page F-12

Section G - PAPER FEED UNIT

Paper release mechanism . . . . page G - 3
Unlocking of the paper release . . . . page G - 7
Automatic line space . . . . page G - 9
Manual line space (repeat) . . . . page G-15
Remarks on manual line space . . . . page G-19

Adjusting the amount of control of the automatic line space . . . . page G-20
Adjusting for exclusion of carriage movement rack engagement . . . . page G-21
Adjusting the closing of the manual line space microswitch . . . . page G-22

Section Z - ASSEMBLY AND DISASSEMBLY PROCEDURES

Manual release of the keyboard . . . . page Z - 3
Removal of the keyboard . . . . page Z - 4
Removal of the Reedswitch board . . . . page Z - 5
Removal of the paper cutter . . . . page Z - 6
Removal of the AW plate . . . . page Z - 7
Removal of the printing unit . . . . page Z - 8

GUIDE TO INTERPRET THE SYMBOLS

The system used in this publication to describe the function of a chain of parts movement presupposes already acquired knowledge of the "principles of basic parts movement".

This means that for every mechanism illustrated, only the mechanical characteristics and their working conditions have been illustrated in a graphic manner.

The development of each topic is generally divided into three distinct phases:

- FOREWORD	describes the purpose and the mechanical function that the mechanism must realize.
- REST	illustrates the parts of the mechanism and the relative rest conditions.
- WORK	illustrates the movements of the mechanism and the consequent working conditions.

On figures without descriptions, graphic symbols have been used. See definitions of symbols on the following pages.

GUIDE TO INTERPRET THE PART MOVEMENT FIGURES

MECHANISM AT REST

Indicates a figure that illustrates the composition and rest position of a mechanism.

MECHANISM AT WORK

Indicates the movement and working conditions of a mechanism.

○

CONTROLLING MECHANISM

Indicates the progressive numbering of parts that make up a controlling mechanism.

□

MECHANISM OF EXECUTION

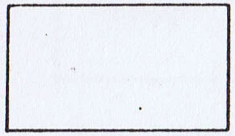
Indicates the progressive numbering of parts that make up a mechanism of execution.

⑤ $\boxed{7}$

$\underline{3}$

IMPORTANT DETAILS

Generally indicates the initial part and final part (or parts) of the mechanism.
(The underscore is used on simple mechanisms that cannot be divided. For example, in controlling mechanisms and mechanisms of execution).



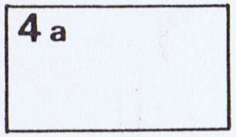
MACHINE CONDITION

It encloses the functional condition.

4_{abc}

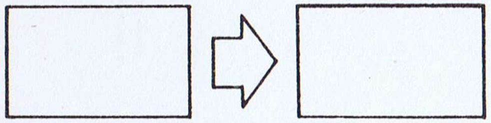
NUMBER WITH INDEX

Indicates a movement (4) that creates other conditions (a, b, c).



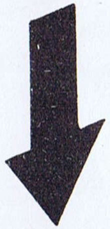
NUMBERED FRAME

Indicates a condition created by numbered movement (4).



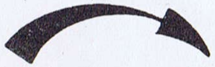
CHANGE OF CONDITION

The arrow connects the frame that illustrates the starting condition with the frame that illustrates the final condition.



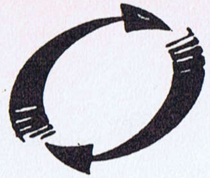
ACTING FORCE

The arrow indicates the point on the mechanism where power is applied.
(Generally it represents the power applied by the operator or by a spring).



DIRECTION OF MOVEMENT

The arrow indicates the direction in which the part (with the arrow drawn on it) moves.



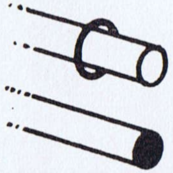
CONTINUOUS ROTATION

Indicates that the part on which it is drawn (usually a shaft, cams, or other rotating mechanism) is in continuous rotation.

▼

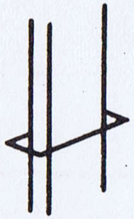
CONTACT

Indicates a contact point between two parts of the mechanism.



ROTATING SHAFT

Indicates a shaft that acts as a rotating shaft. Indicates a shaft that acts as a pivot shaft.



LATERAL GUIDE

Generally indicates a guiding slot.

L

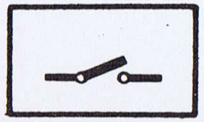
CLEARANCE

Indicates that a clearance is present.

P

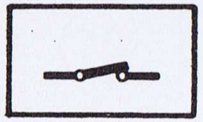
HOLD

Indicates that a hold is present.



OPEN CIRCUIT

Indicates that the electric component (electromagnet, solenoid, motor) to which it is referred is not receiving current.



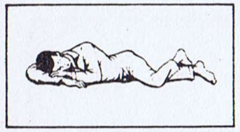
CLOSED CIRCUIT

Indicates that the electric component to which is referred is receiving current.

REMARKS ON THE FIGURES RELATED TO:

Foreword

Only the parts mentioned in the text are numbered.
In the frames are illustrated the conditions of the mechanical functions realized.



CONDITION OF REST

The parts that make up the mechanism are progressively numbered.
The frames illustrate the conditions of rest.

CONDITION OF WORK

The arrows that indicate the movement of the parts, making up the mechanism, are progressively numbered.
If the parts of the mechanism perform their function, within the prescribed time, in different directions, the movements are illustrated on two or more consecutive figures. The progressive numbering of the movement begins on the first figure and ends on the last one.

The symbol that characterizes consecutive figures of movement is progressively numbered. For example:

On every figure the prospective drawing illustrates the starting condition. The detail frames illustrate the final condition and are connected to the movement that caused them.

GUIDE TO INTERPRET THE ADJUSTMENT FIGURES

PRELIMINARY OPERATIONS

This frame illustrates an operation necessary to bring the machine in the proper condition to make the adjustment.

INSPECTION

This frame illustrates a clearance (or hold, etc.) to be checked.

OPERATION (ADJUSTMENT)

This frame illustrates the operation necessary to obtain the required clearance.

INSPECTION IN MOVEMENT

The condition to be checked shown in half of the frame is checked while the operation shown in the adjacent area is performed.

MACHINE TO REST

This frame indicates that the machine must be placed in a rest condition manually or electrically.

Z-2

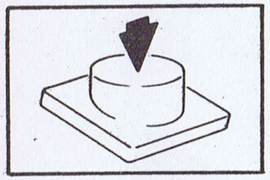
PROCEDURES

This frame indicates the page of "SECTION Z - PROCEDURES" where a description of a generally complex operation is explained.

% C-7

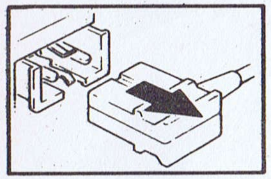
CONTINUE ON

This frame indicates the page where an adjustment is to be continued.



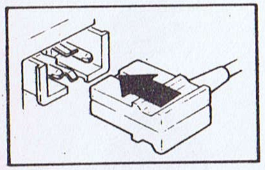
DEPRESS THE KEY

This frame indicates key depression. If the illustration of the key does not indicate a specific sign, the depression of any key is understood.



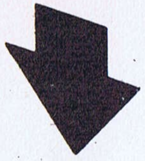
REMOVE THE LINE CORD

This frame indicates that the machine must be disconnected from the power source.



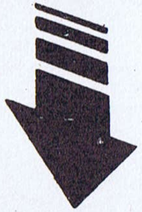
CONNECT THE LINE CORD

This frame indicates that the machine must be connected to the power source.



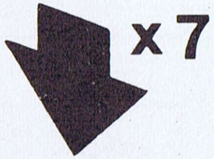
CONTROL

This arrow indicates at what point and in what direction a part is to be moved.



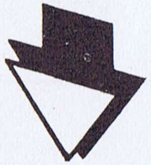
SLOWLY CONTROL

This arrow indicates that the part must be moved slowly.



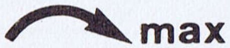
REPEAT CONTROL

The operation must be repeated as many times as the number shows.



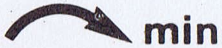
KEEP

The symbol shows that the part must be maintained in the position reached as a result of movement in the direction of the arrow.



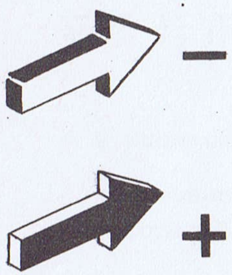
MAXIMUM MOVEMENT

Indicates the maximum movement made by the part in the direction of the arrow.(Adjustments should be accomplished at the instant that the maximum condition is reached).



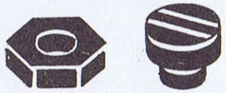
MINIMUM MOVEMENT

Indicates the minimum movement made by the part in the direction of the arrow. (Adjustments should be accomplished at the instant that the minimum condition is reached).



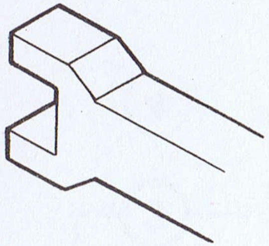
DIRECTION OF ADJUSTMENT

The arrows indicate the direction in which a part has to be moved in order to obtain the desired clearance. If the clearance checked is smaller than the desired one, use + direction. If the clearance checked is larger than the desired one, use − direction.
If the adjustment consists in the equality of two clearances (for example $L = L_1$) the clearance referred to by the direction of adjustment is always the first one (L).



ADJUSTMENT

The screw or nut shown "Negatively" must be loosened in order to perform the adjustment.



FORM

This illustration indicates the point on a part that must be formed. The adjustment can be performed with a Former or other suitable tool.

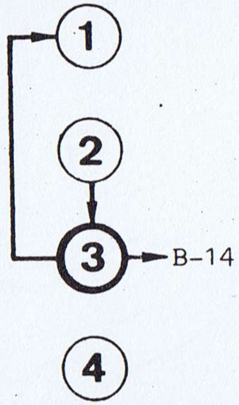
L

SMALL CLEARANCE

DESCRIBED OPERATION

This frame with a description of the operation to be performed is used whenever a graphic representation will not suffice.

Check that the printed characters are not cut on top nor on the bottom



RELATIONSHIP BETWEEN ADJUSTMENTS

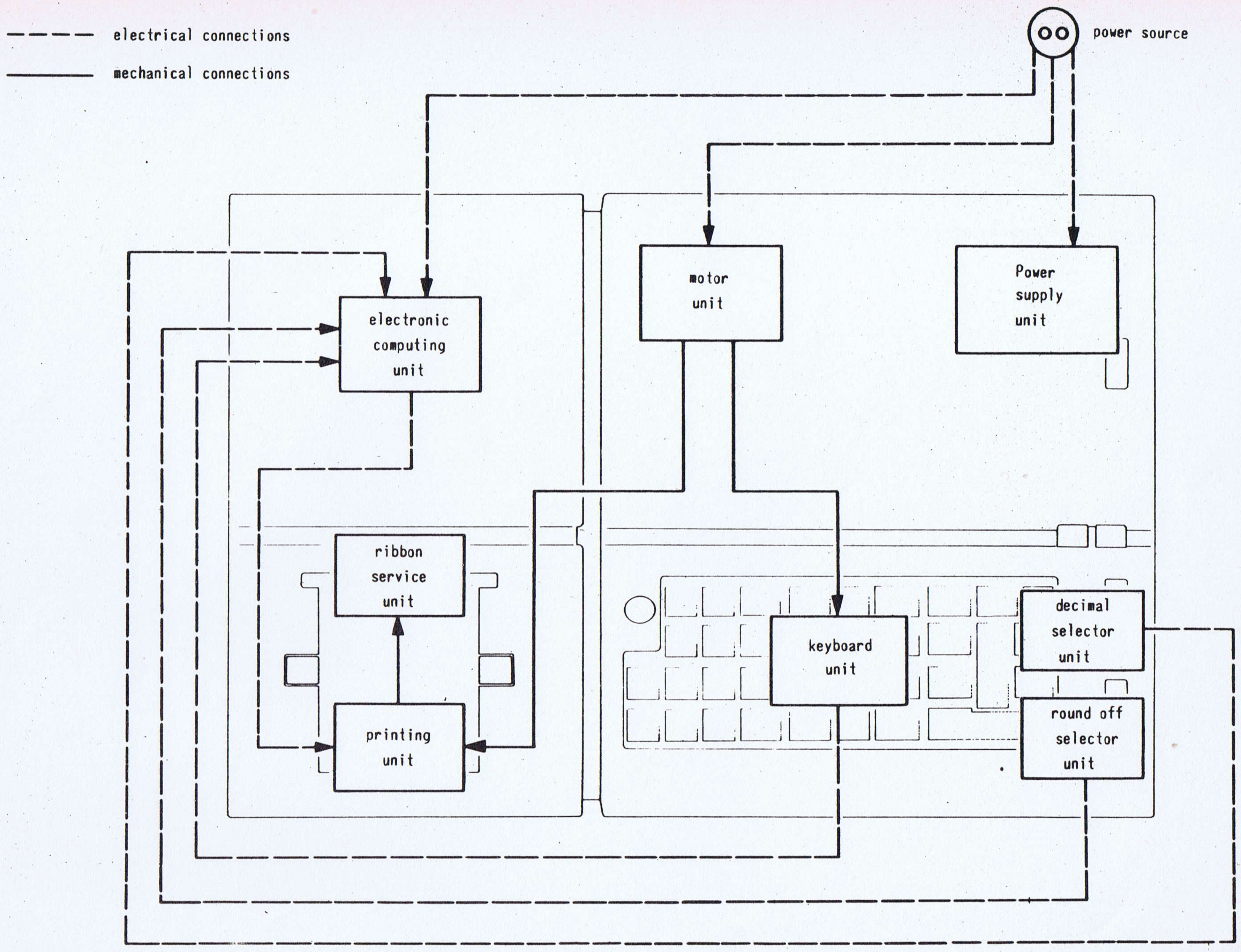
These symbols indicate the relationship between the adjustment to be performed (indicated by the circle drawn in heavy ink) and other adjustments. The outgoing line indicates that the adjustment affects the one which is connected (for example adjustment 3 affects adjustment 1). The connecting line that enters indicates that the adjustment is dependent on the one which is connected (for example adjustment 3 depends on adjustment 2). If the connecting lines are missing, the adjustment is independent from others (for example adjustment 4). All the adjustments enclosed in a circle belong to the same unit. The connection between an adjustment enclosed in a circle and page number (for example adjustment B-14) indicates that the adjustment is related with another unit (for example adjustment shown on page 14, Section B).

REMARKS RELATED TO THE ADJUSTMENT FIGURES

- All frames that illustrate operations, conditions, and procedures related to the adjustments to be performed are progressively numbered.
- In the performance of the adjustment it is understood that the removal of the case must be performed before any other operation.
- If during the adjustment it was necessary to remove parts from the machine, it is understood that these parts must be reassembled at the end of the adjustment.
- A knowledge of the use of a VOM is presupposed during adjustment procedures requiring meter application.

NOTE: It is very important to pay attention to the notes written on the bottom of the illustration pages.

PART MOVEMENTS AND ADJUSTMENTS


electrical connections
mechanical connections
power source
electronic computing unit
motor unit
Power supply unit
ribbon service unit
printing unit
keyboard unit
decimal selector unit
round off selector unit

Introduction

The LOGOS 270 is an electronic calculator consisting of a number of functional units. These units can be individually removed from the machine.
Each unit is mechanically independent from the others. Excluding the mechanical power distribution, all mechanisms that make up the units are contained within the units and do not interfere with the mechanisms related to other units.

The functional units are listed below:

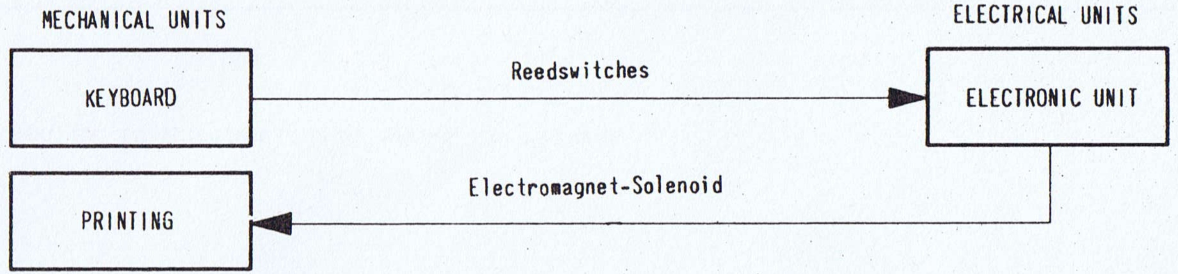
Electrical units	Mechanical units
- POWER SUPPLY UNIT	- MOTOR UNIT
- ELECTRONIC COMPUTING UNIT (ECU)	- KEYBOARD UNIT
- DECIMALS SELECTOR UNIT	- PRINTING UNIT
- ROUND OFF SELECTOR UNIT	- RIBBON UNIT
	- PAPER FEED UNIT

Note:

The units are organized as is schematically shown in figure.

This publication includes only units whose functions are mainly mechanical. The functional descriptions of the electric units are dealt with in a separate publication.

The connection between the mechanical section of the LOGOS 270 and the electronic section is schematically shown below:



The "electronic unit" can be manually activated by the operator through the "keyboard unit".

The keyboard unit, because of its characteristic of being the access to the machine, is called the ENTRANCE UNIT.

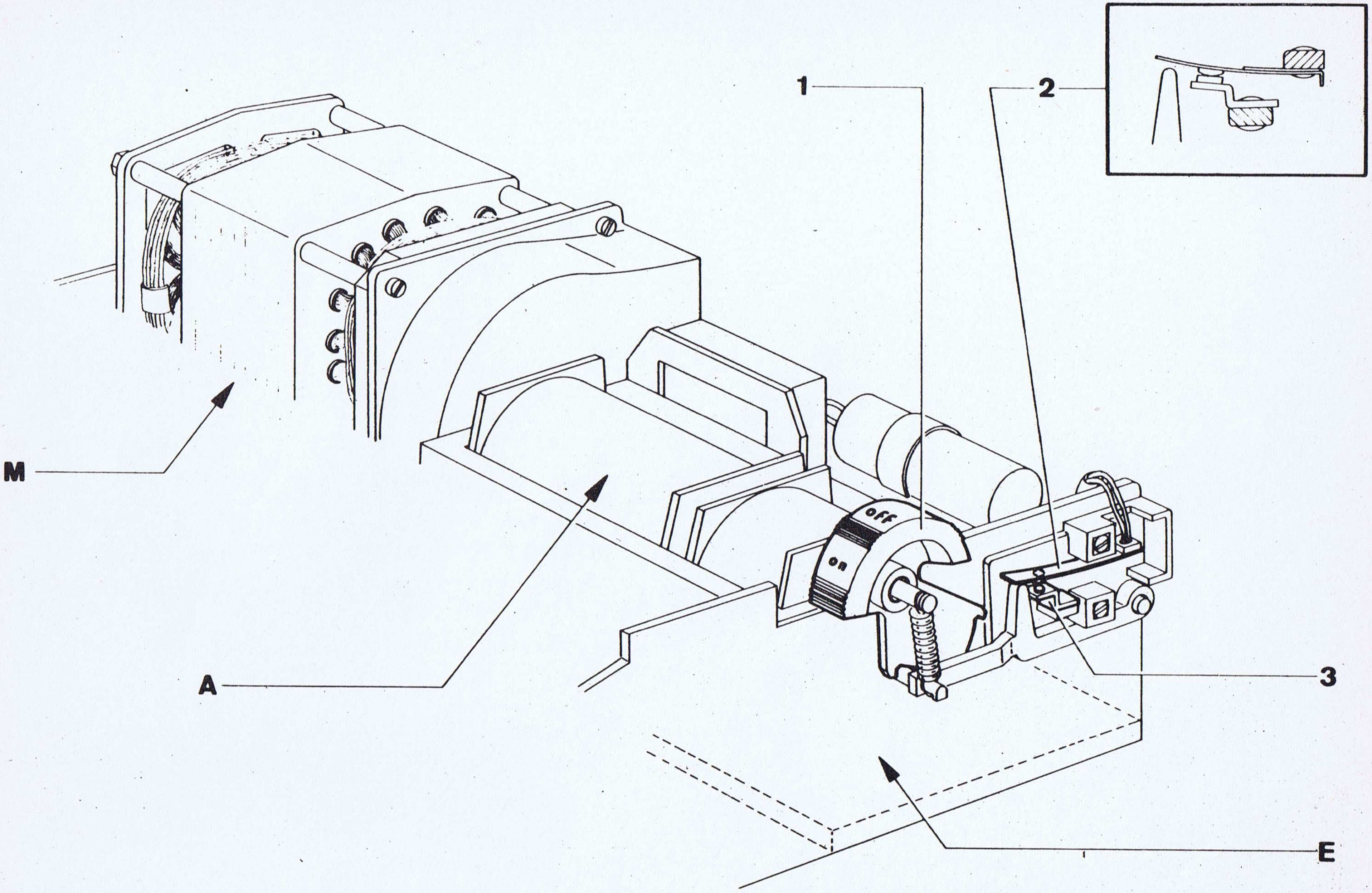
The "electronic unit", on the basis of the commands received, will activate the "printing units".
The printing units, being the units that connect the electronic unit with the outside (operator), are called the EXIT UNITS.

The components used to connect the electronic unit functions to the mechanical unit functions are of two types:

- Reedswitches (utilized by the mechanical units to control the electronic unit).
- Solenoids and Electromagnet (utilized by the electronic unit to control the mechanical units).

Section A

MOTOR UNIT


1
2
3
M
A
E
off
on

Closing of the power circuit

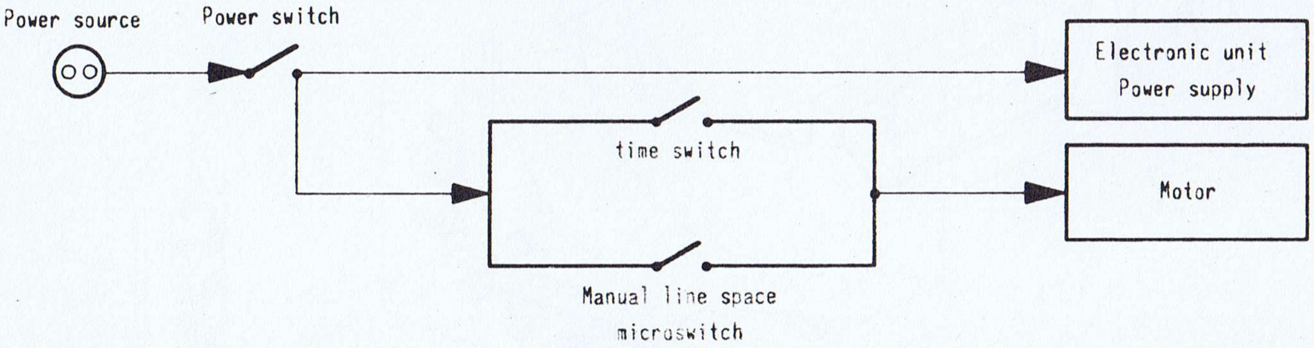
The power circuit electrically connects the following units:

- Power supply A
- Electronic unit E
- Motor M

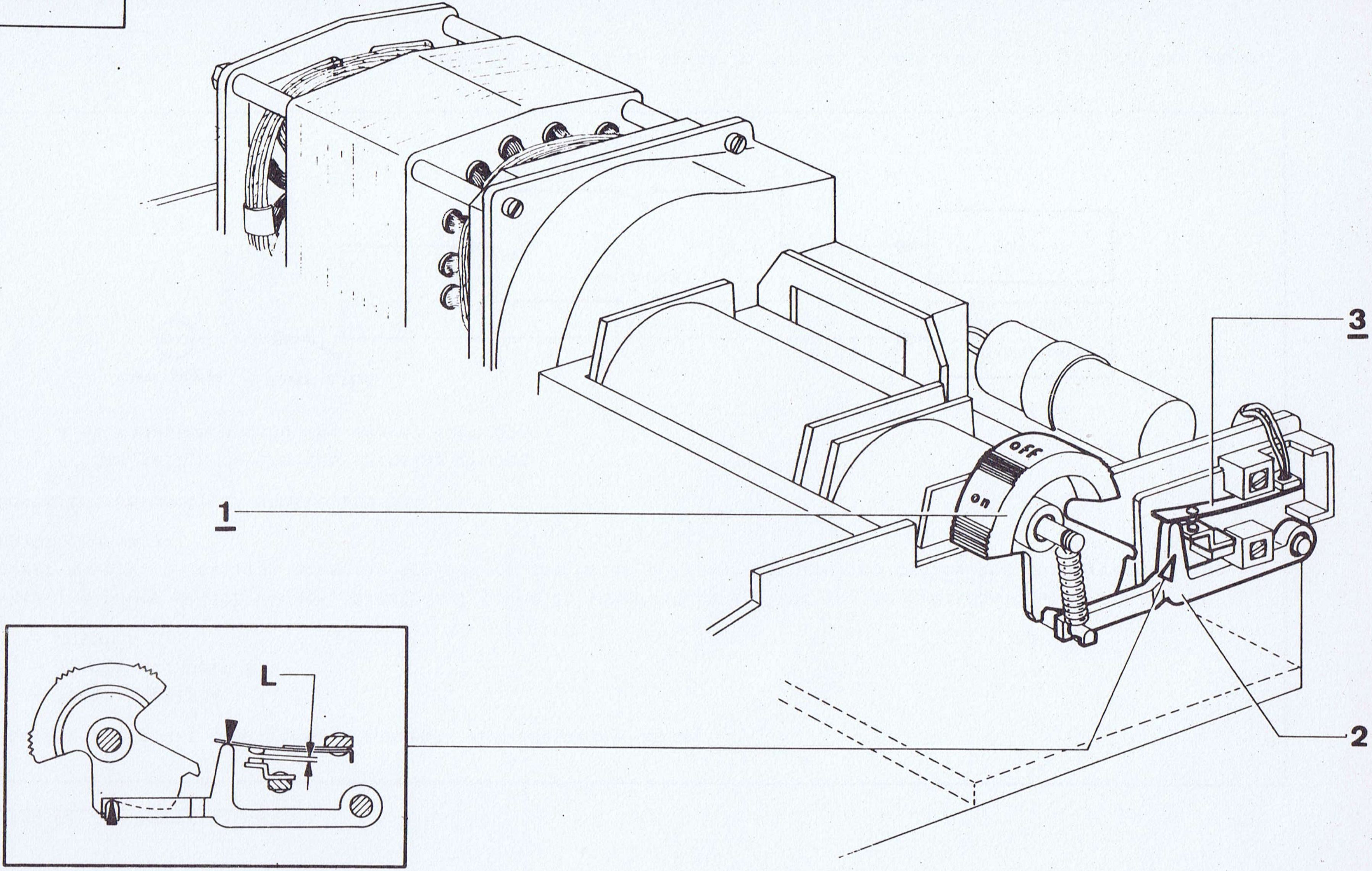
When the power switch closes, electrical power is immediately applied to the electronic unit and to the power supply. Electrical power is applied to the motor only during printing cycles and during repeat line space (manual).

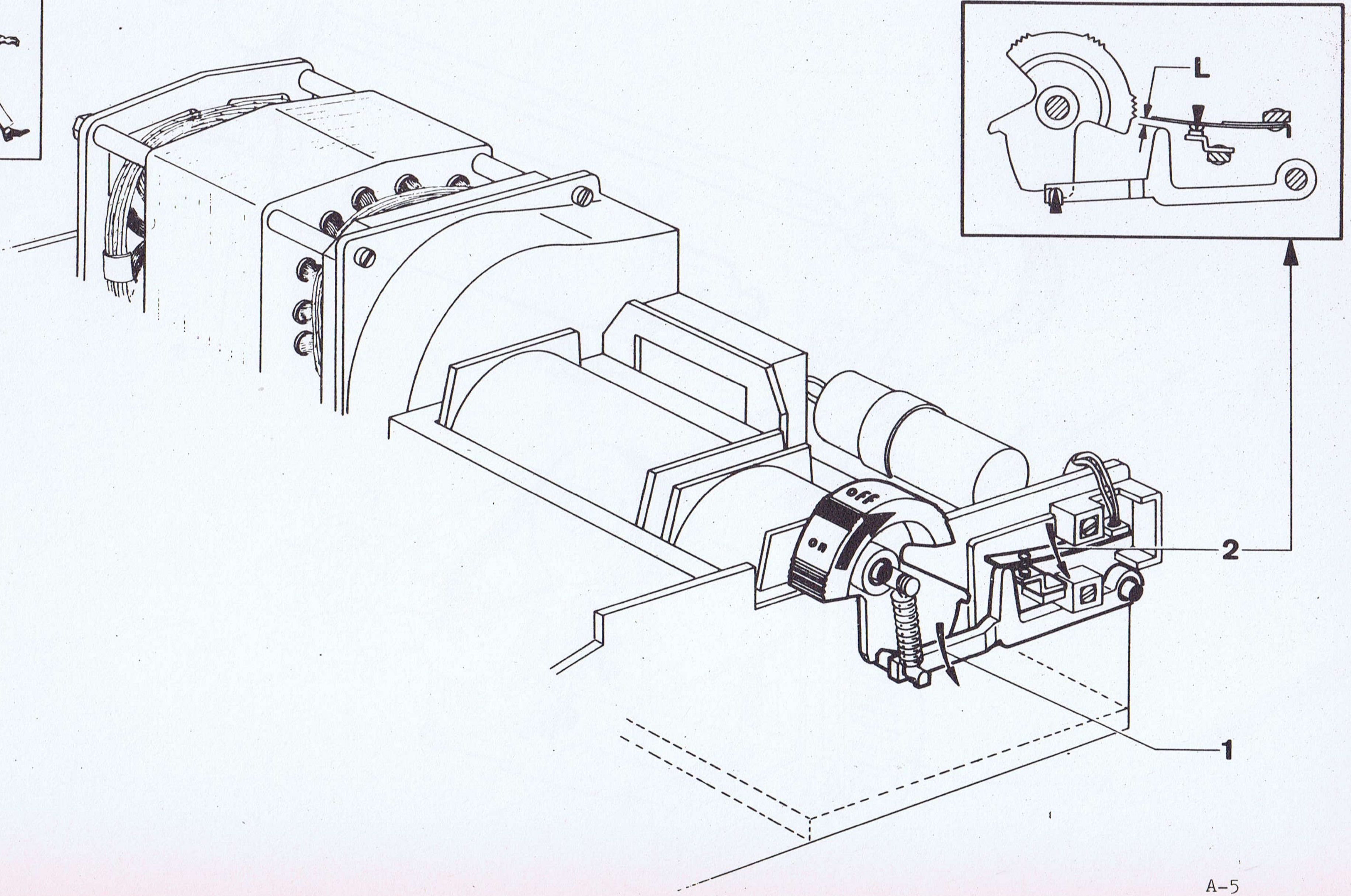
Power to the motor is controlled by:

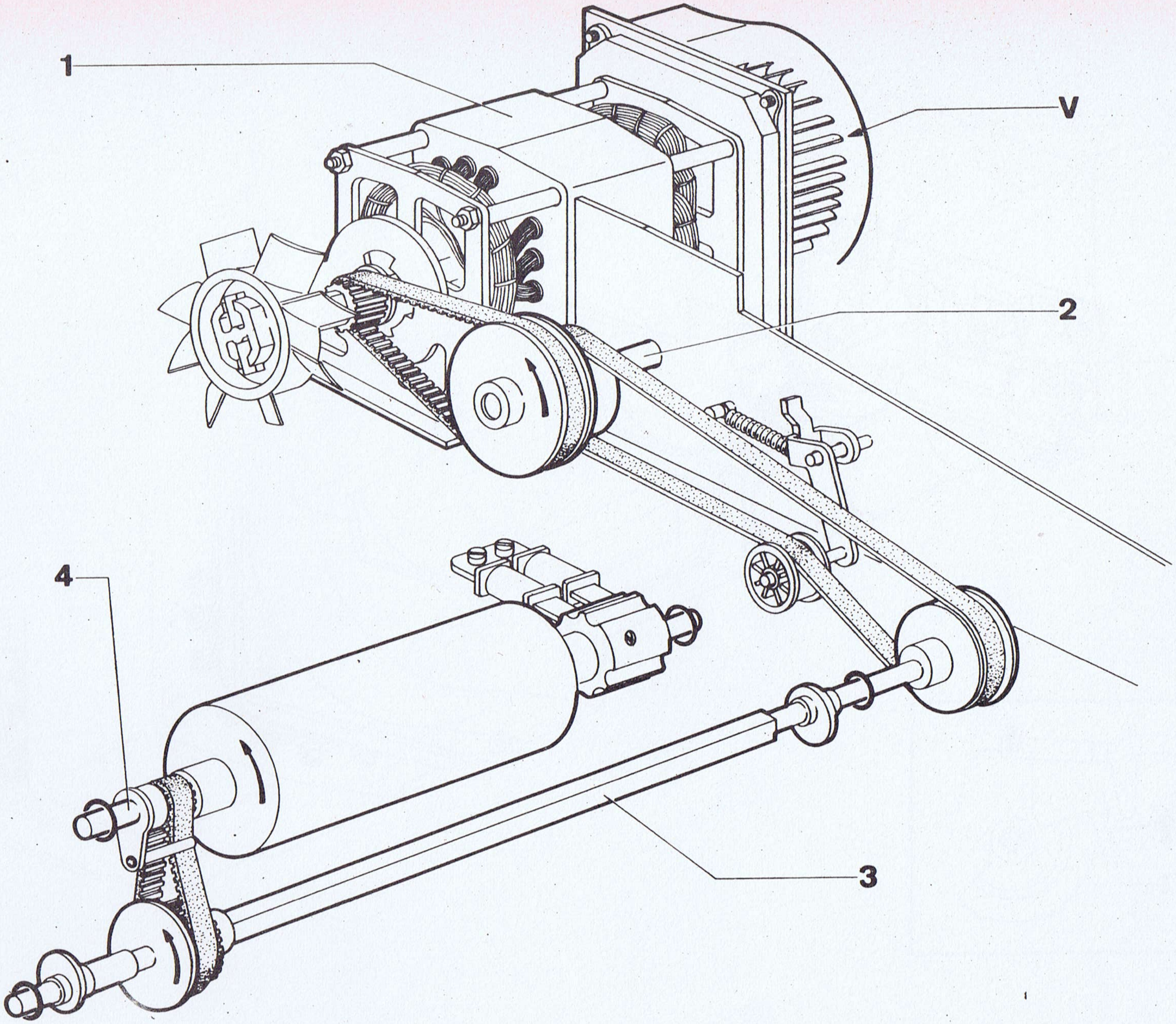
- A time switch during the printing cycles
- A microswitch during the repeat line space



Rotating power switch (1) to the ON position, blade (2) is moved in contact with fixed blade (3) and the power circuit is closed.


off
on
1
2
3
L


L
2
off
on
1


V

Mechanical power distribution

Whenever the motor (1) is turned on, its movement is transferred through a system of belts and pulleys to the following functional units:

- Keyboard, through the servo shaft (2)
- Printing, through shafts (3) and (4).

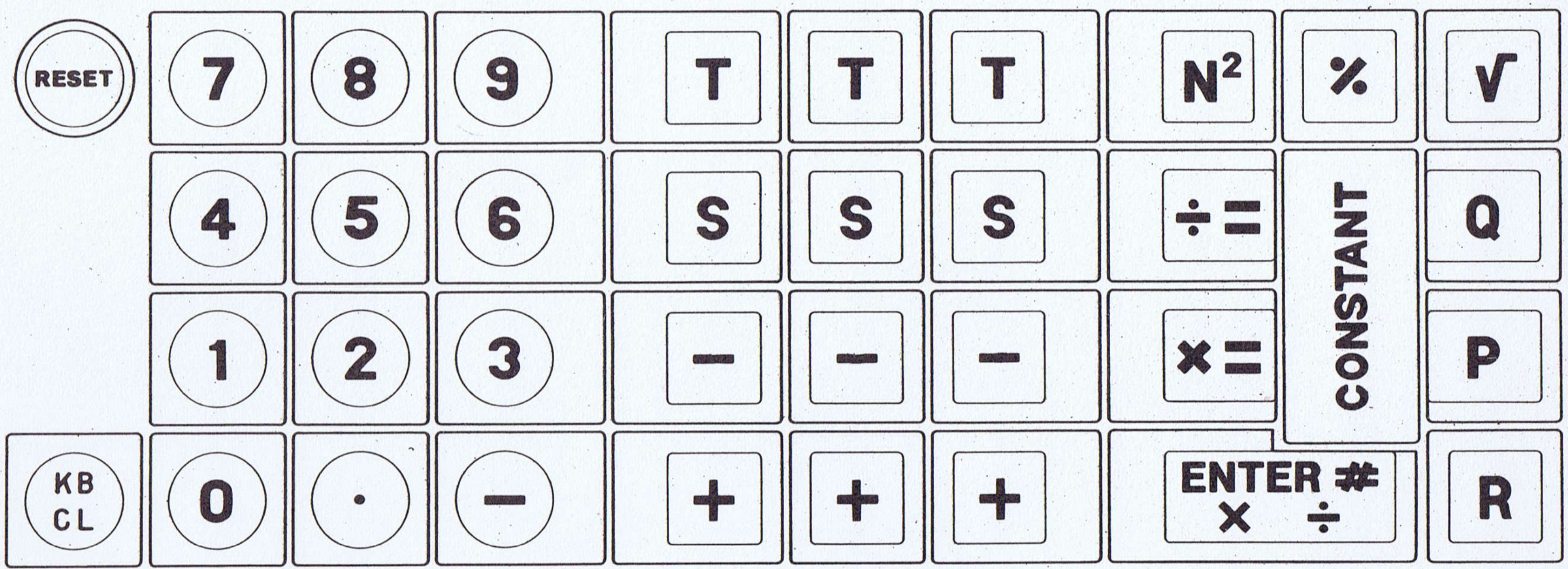
Note:

The motor also drives fan (V) for cooling the "power supply unit".

Section B

KEYBOARD UNIT

Introduction



The keyboard consists of 36 operative keys. Their functions have been explained in the "Features and characteristics" manual.
Upon the depression of each key, a series of electrical signals are sent to the electronic unit.
These electrical signals are abtained by opening or closing six Reedswitches called AA, AB, AC, AD, AE, AF.

The functional conditions of a Reedswitch are conventionally represented with the digit 1 (closed) and 0 (open). Consequently the function of every key (that in a specific way controls the above mentioned Reedswitches) is received by the electronic unit under a form of a six digit code (for example: 001001).

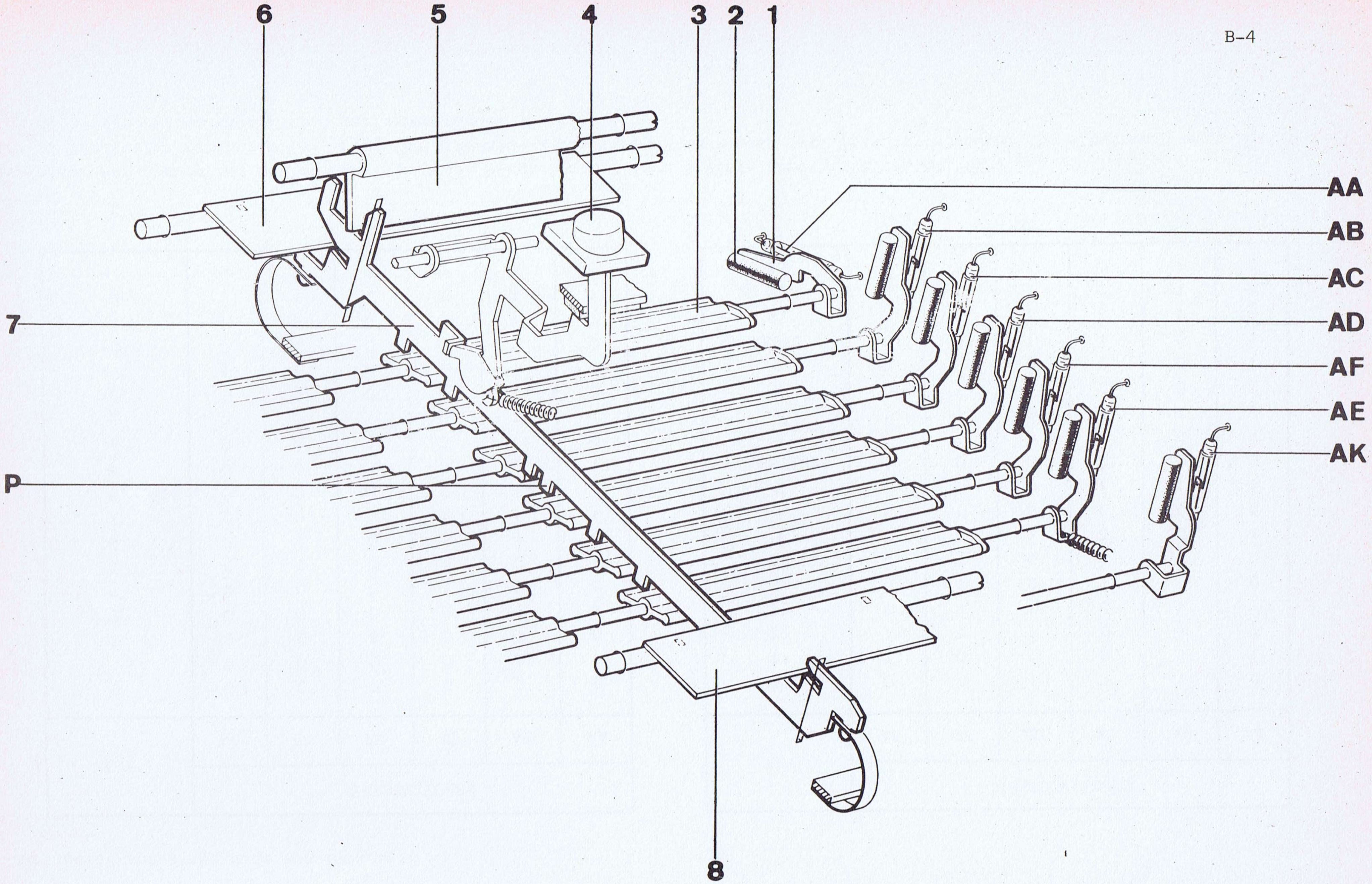
Chart below shows the code system used:

KEY	REEDSWITCHES					
	AE	AF	AD	AC	AB	AA
0	0	0	0	0	0	0
1	0	0	0	0	0	1
2	0	0	0	0	1	0
3	0	0	0	0	1	1
4	0	0	0	1	0	0
5	0	0	0	1	0	1
6	0	0	0	1	1	0
7	0	0	0	1	1	1
8	0	0	1	0	0	0
9	0	0	1	0	0	1
.	0	0	1	0	1	0
–	0	0	1	0	1	1
+1	1	0	0	0	1	0
+2	1	1	0	0	1	0
+3	0	1	0	0	1	0
–1	1	0	0	0	1	1
–2	1	1	0	0	1	1
–3	0	1	0	0	1	1

KEY	REEDSWITCHES					
	AE	AF	AD	AC	AB	AA
CLEAR	0	0	1	1	0	0
T1	1	0	1	0	1	1
T2	1	1	1	0	1	1
T3	0	1	1	0	1	1
X	0	1	0	1	0	0
N^2	0	1	0	1	1	0
#	0	1	1	0	0	1
÷	0	1	0	0	0	0
%	0	1	0	1	1	1
CONSTANT	1	0	0	0	0	0
P	0	1	0	1	0	1
√	1	1	0	1	1	0
R	0	1	1	0	0	0
Q	0	1	0	0	0	1
RESET	0	0	1	1	0	1
S1	1	0	1	0	1	0
S2	1	1	1	0	1	0
S3	0	1	1	0	1	0

Note:

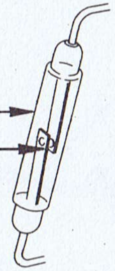
Essential for operation, besides the six "code Reedswitches" is a seventh Reedswitch called "AK". The AK Reedswitch is controlled after the six "code Reedswitches" have been set. This is to signal the electronic unit that the coding of the wanted instruction has taken place.


6
5
4
3
2
1
AA
AB
AC
AD
AF
AE
AK
7
P
8

Principle of the keyboard unit operation

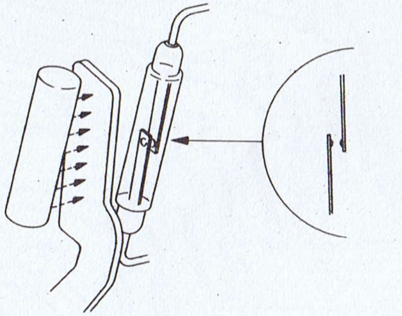
The "code Reedswitches" AA, AB, AC, AD, AE, AF and "validation Reedswitch" AK are comprised of:

- a glass envelope
- two metal contacts

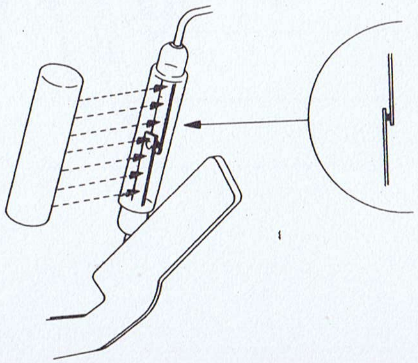


Facing each Reedswitch is:

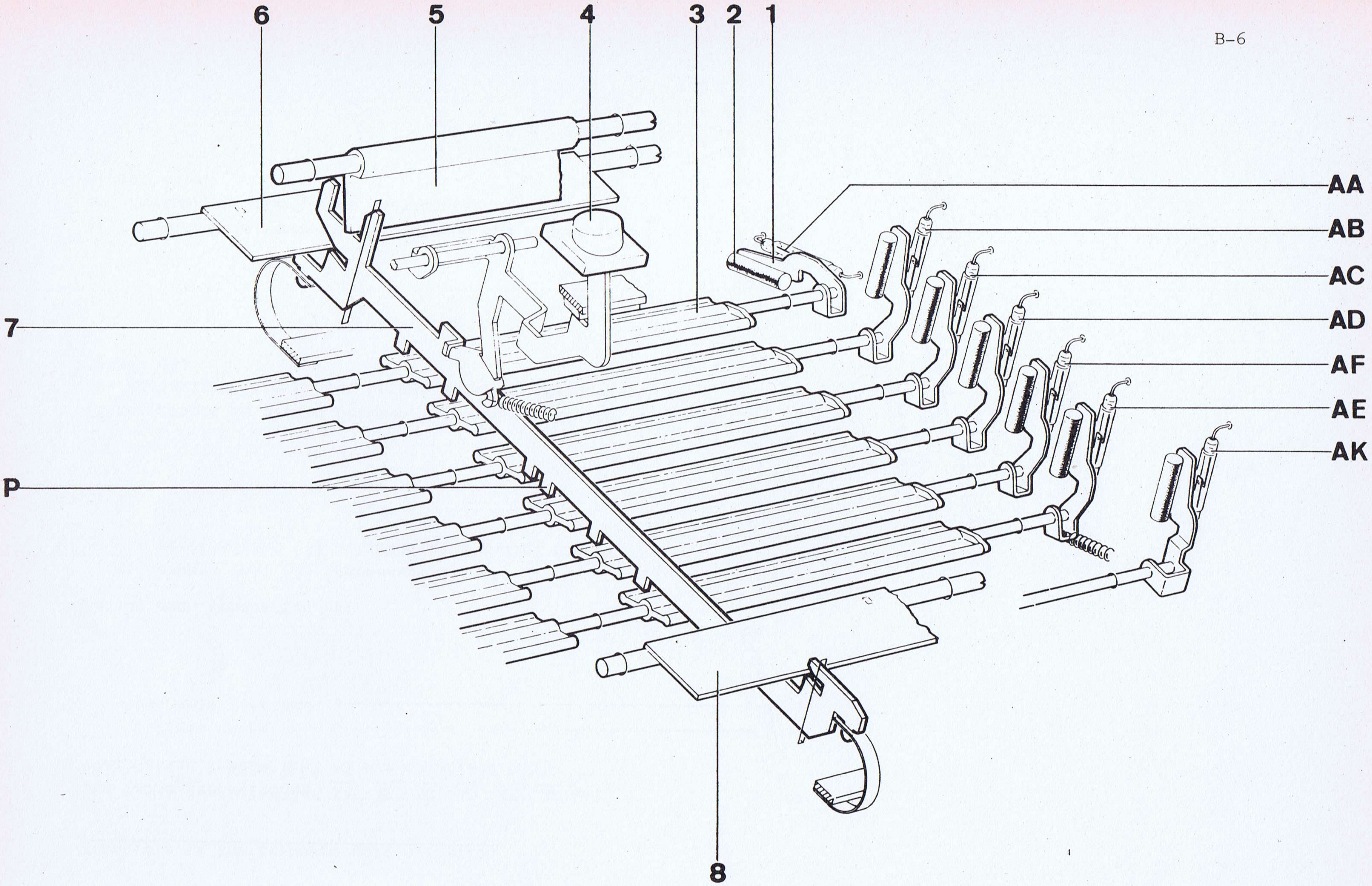
- a magnet roll (2) (permanent magnet)
- a metal screen (1) attached to a coding bar (3)



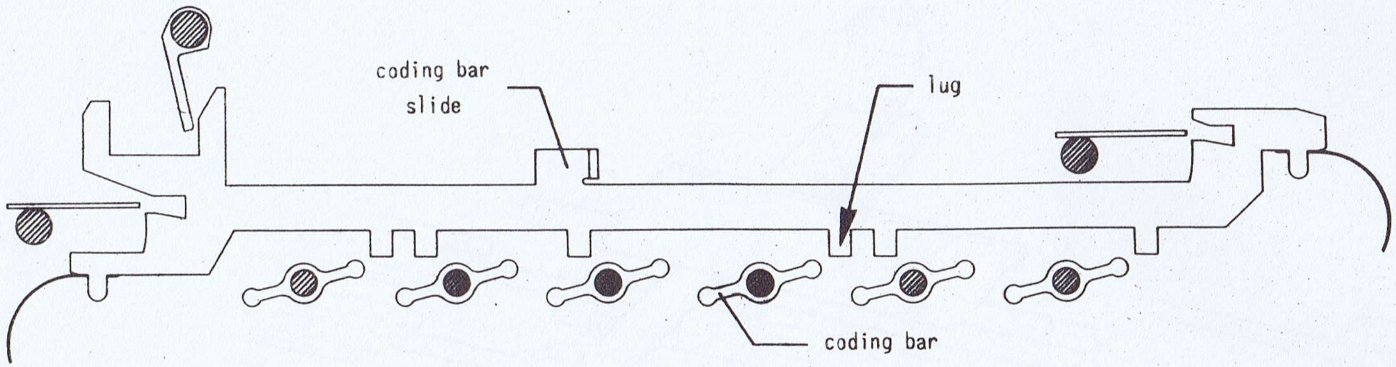
If the screen is placed between the magnet roll and the Reedswitch, the blades become detached (Reedswitch OPEN = 0).



If the screen is removed from between the magnet roll and Reedswitch, the blades make contact (Reedswitch closed = 1).

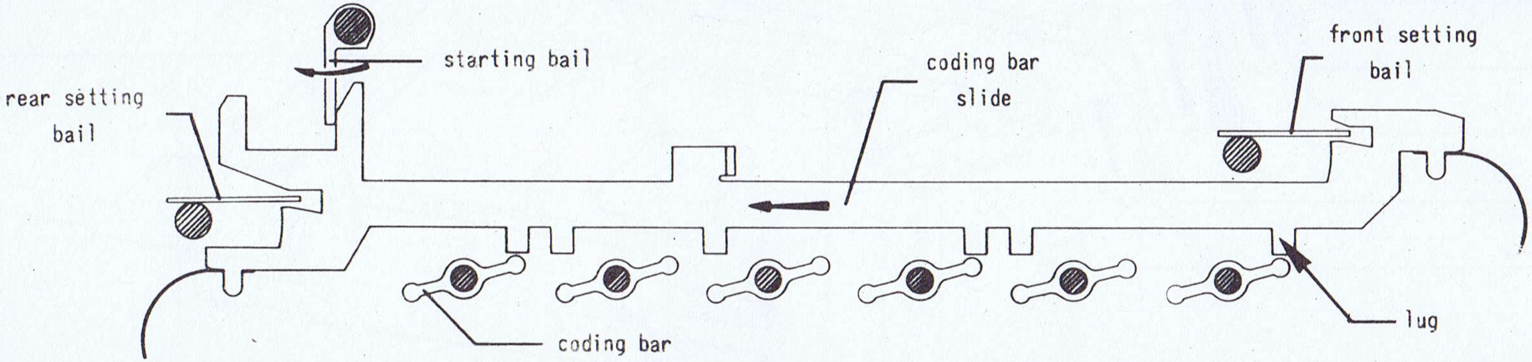

6
5
4
3
2
1
AA
AB
AC
AD
AF
AE
AK
7
P
8

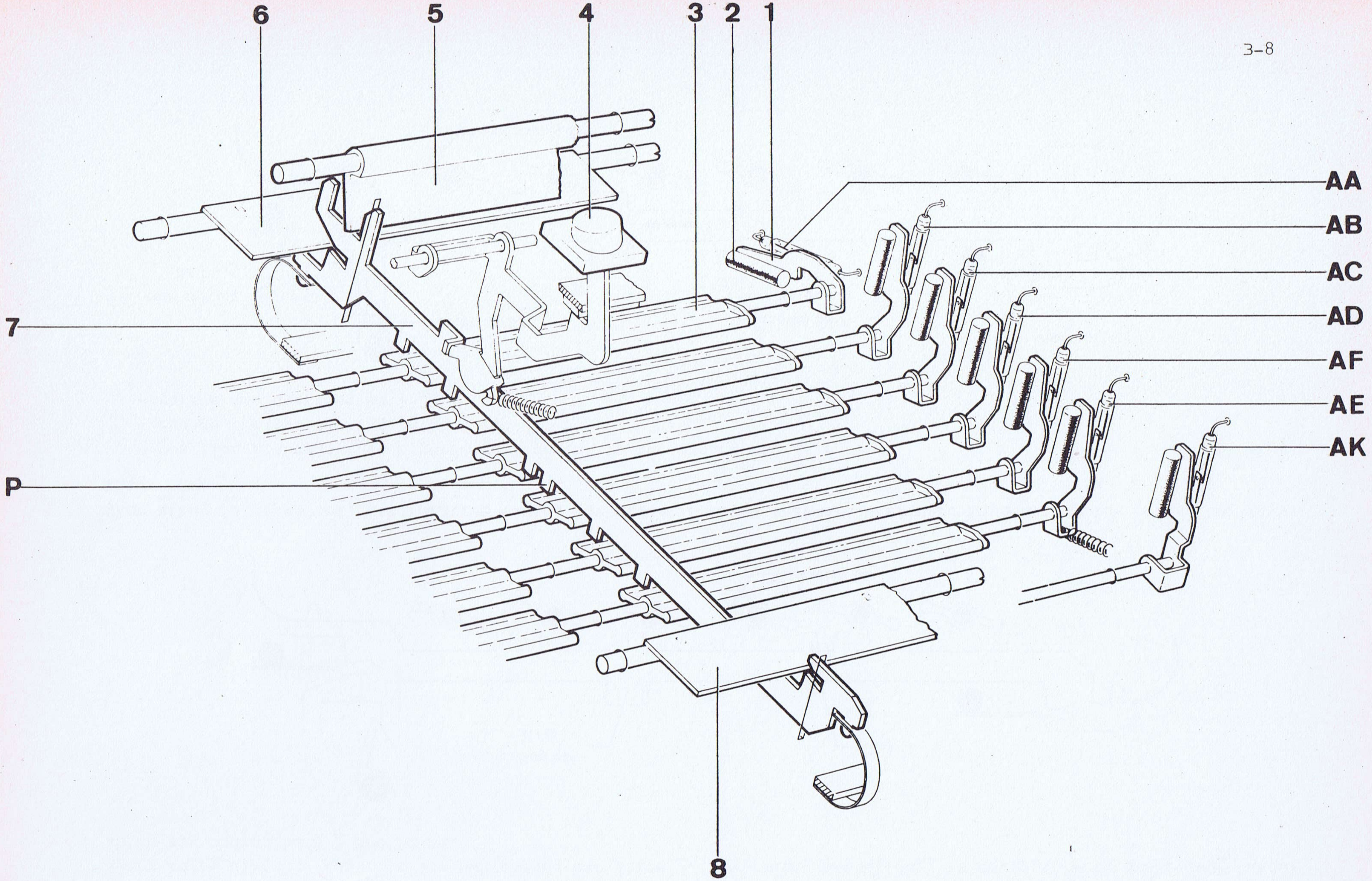
Every key 4 directly controls its own coding bar slide 7. The coding bar slide 7 is equipped with six lugs P under which six coding bars 3 are found.



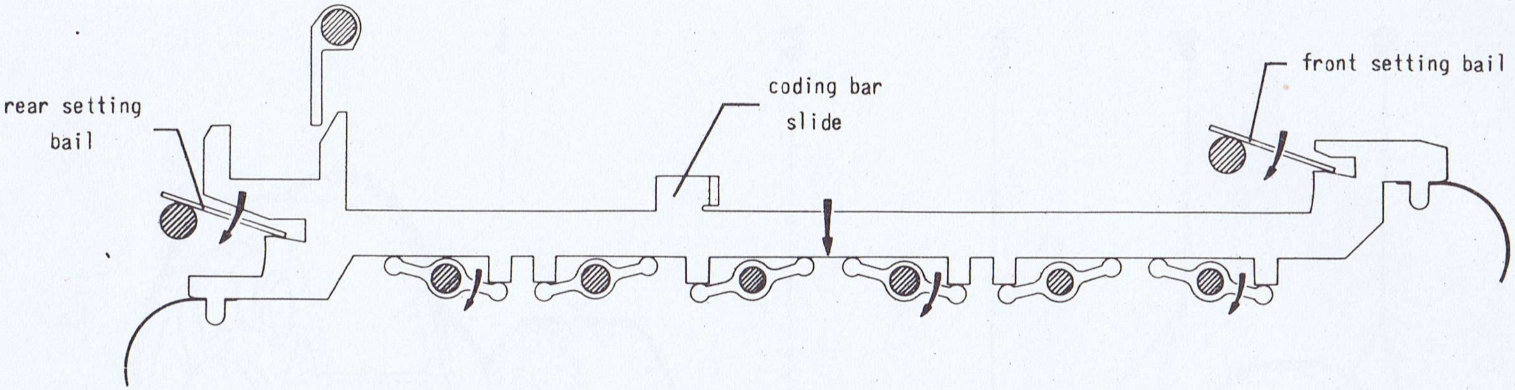
When a key is depressed, its relative coding bar slide is moved rearward. Rearward movement of the coding bar slide will:

- position its lugs P in a perfect alignment to the coding bar 3
- engage the two setting bails 6 and 8
- rotate the starting bail 5

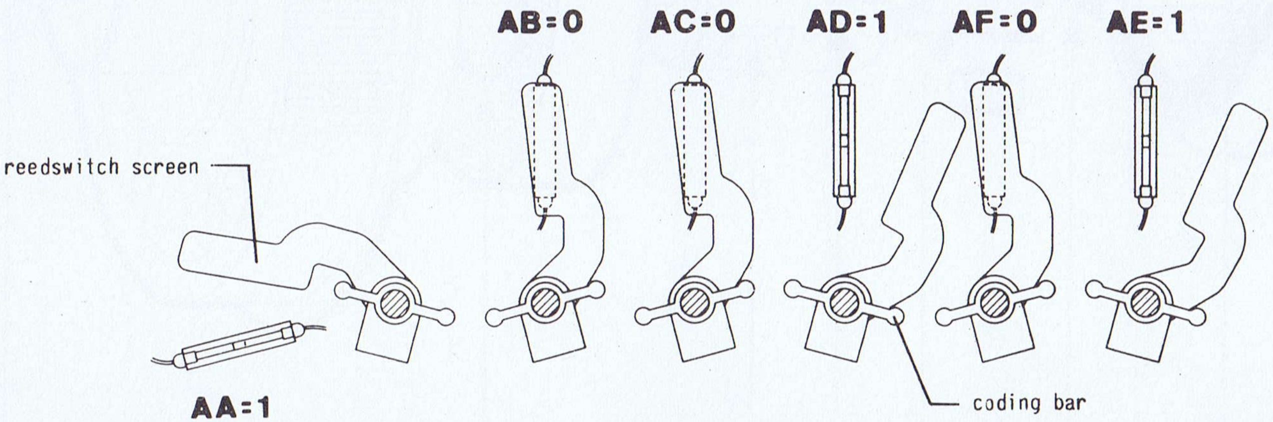



6
5
4
3
2
1
AA
AB
AC
AD
AF
AE
AK
7
P
8

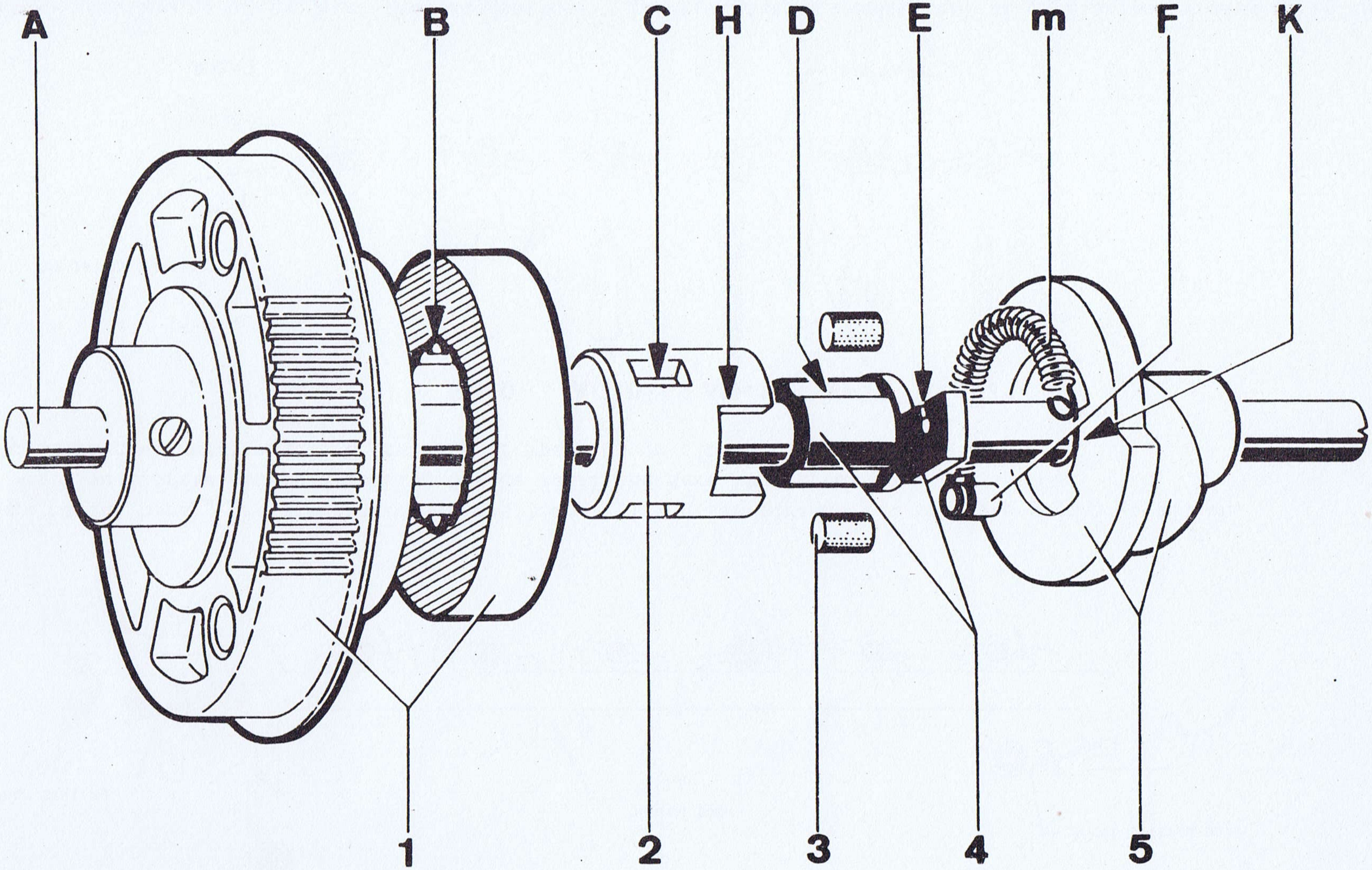
As a result the entry servo clutch is engaged causing the two setting bails 6 and 8 to rotate downward lowering coding bar slide 7.



The six coding bars 3 are simultaneously positioned giving the screens 1 a suitable angular position.
This position is retained by a locking device until the next key depression.
The "code Reedswitches" assume a position of open (0) or closed (1).



After the positioning of the six "code Reedswitches" the "validation Reedswitch" AK is also positioned (AK = 1).


A
B
C
H
D
E
m
F
K
1
2
3
4
5

Entry servo clutch

The entry servo clutch is located on the servo shaft A. It has the function of controlling the rotation of the "entry cam group" 5.

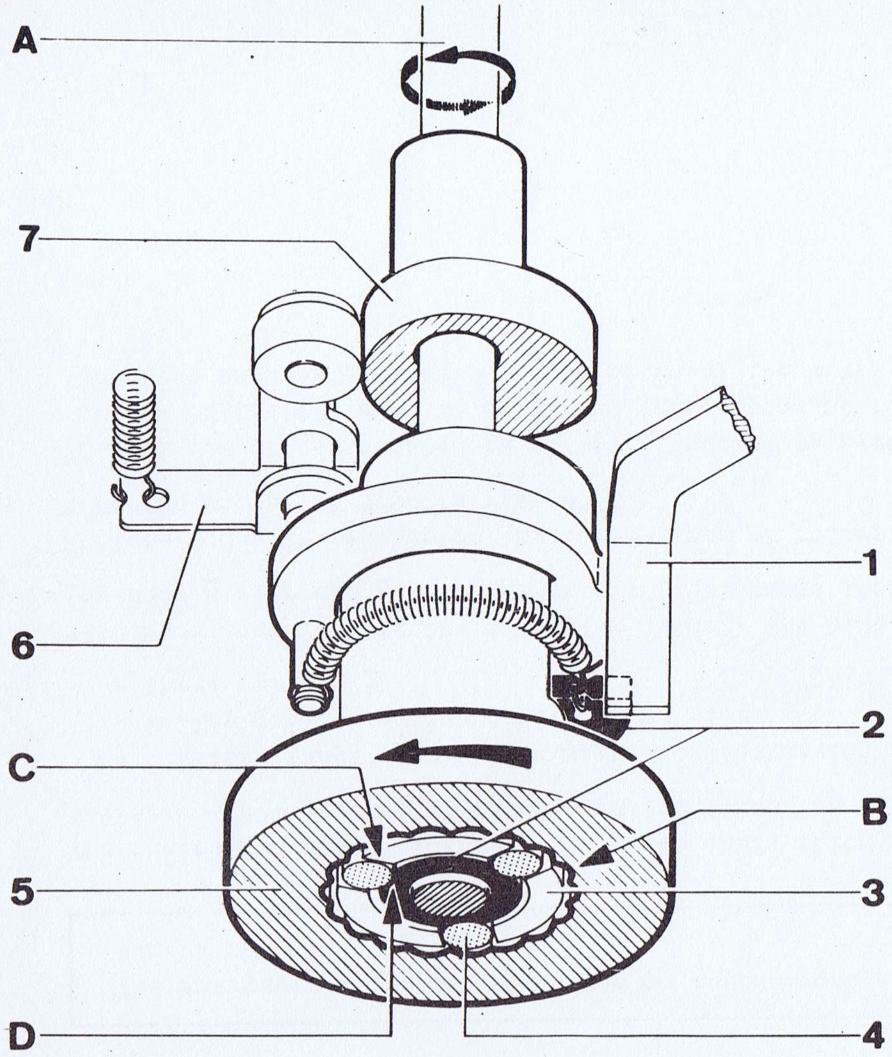
The "entry cam group" idles on the servo shaft which is kept in constant rotation by pulley 1.
The servo clutch which is between pulley 1 and the "entry cam group" 5, is comprised of:

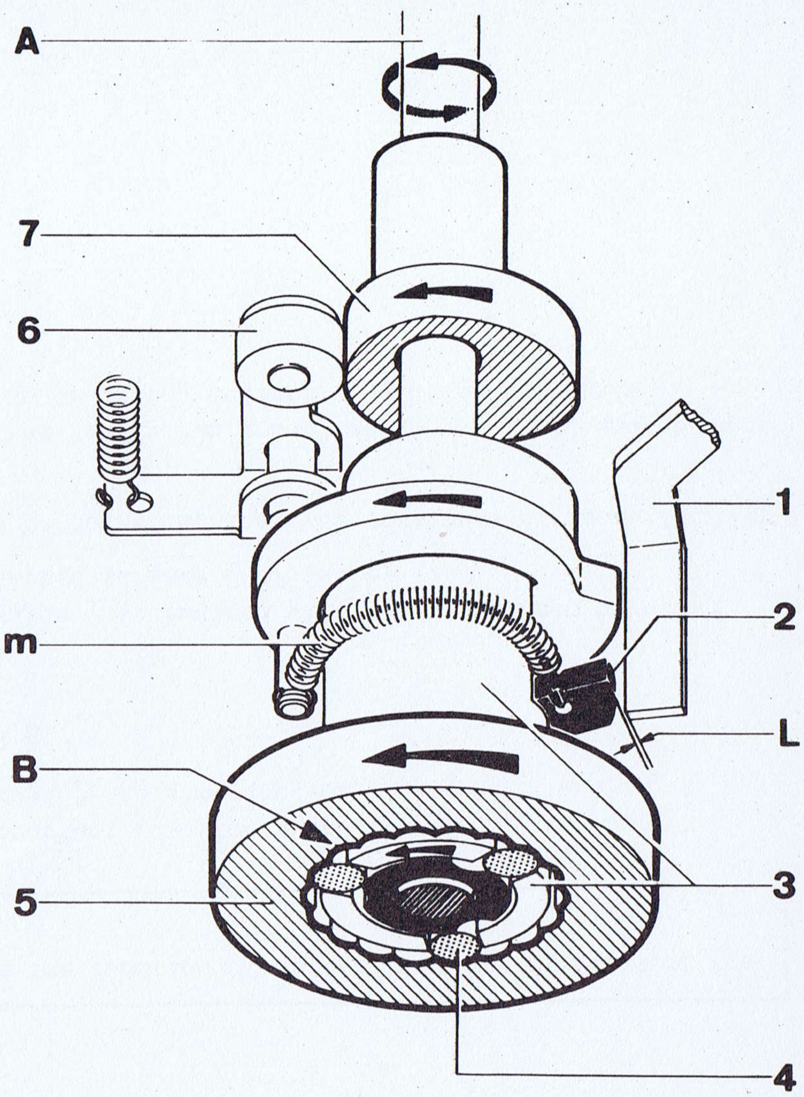
- "clutch flange" 4 equipped with a collar having three dwells D
- roller guide 2 equipped with three slots C
- three rollers 3

"Clutch flange" 4 fits inside roller guide2. One side of roller guide 2 is engaged with the "entry cam group" 5 (opening H with hub K). The other side is located inside the scalloped surface B of pulley 1.

Rollers 3 can travel inside the three slots of roller guide 2 and be locked against the scalloped surface of pulley 1 by the collar of "clutch flange" 4.

"Clutch flange" 4 is moved by spring m (hooked between stud F of the "entry cam group" and the hole E) and can assume two different angular positions (corresponding to the position of clutch engaged or clutch disengaged).
These two angular positions are selected by the entry mechanism.


A
C
B
D


A
m
L
B

The entry servo clutch is controlled by servo trip bridge 1 of the entry mechanism.

CLUTCH DISENGAGED

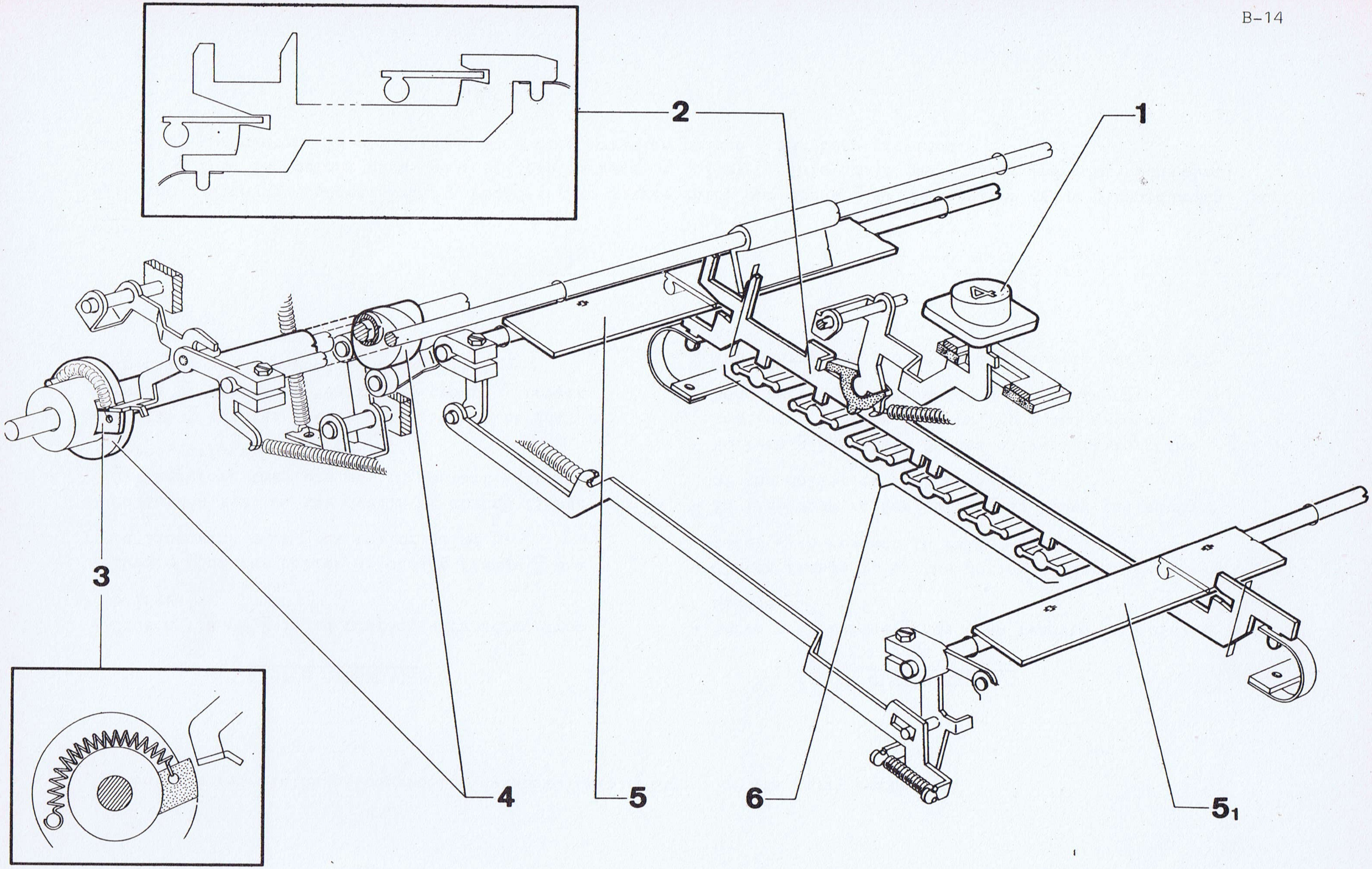
- Clutch flange 2 is in contact with servo trip bridge 1:
- Dwells D of the collar of clutch flange 2 are in line with slot C of roller guide 3.
- Rollers 4 rest on the dwells of clutch flange 2. Therefore they are not in contact with scalloped surface B of pulley 5.
- Pulley 5 rotates freely with respect to roller guide 3. Therefore "entry cam group" 7 remains inactive with respect to servo shaft A.

CLUTCH ENGAGED

- Servo trip bridge 1 has been removed from clutch flange 2.
- Clutch flange 2, by the action of spring m, rotates with respect to roller guide 3.
- In line with roller guide 3 is found the surface of the collar of clutch flange 2.
- Rollers 4 have been pushed outward against the scalloped surface B of pulley 5 and created a bond between roller guide 3 and pulley 5.
- The "entry cam group" 7 rotates with servo shaft A.

Note:

With the clutch disengaged spring m could try to rotate entry cam group 7 so that roller guide 3 could bring rollers 4 into engagement with the scalloped surface of pulley 5. This could cause noise and continuous oscillation of the clutch. To avoid this, a counter rotation bridge 6 has been provided.


5₁

Entry mechanism

Upon the depression of a keyboard key, the entry servo clutch is engaged and a related coding bar slide is moved towards the coding bars so as to position them angularly.

Controlling mechanism

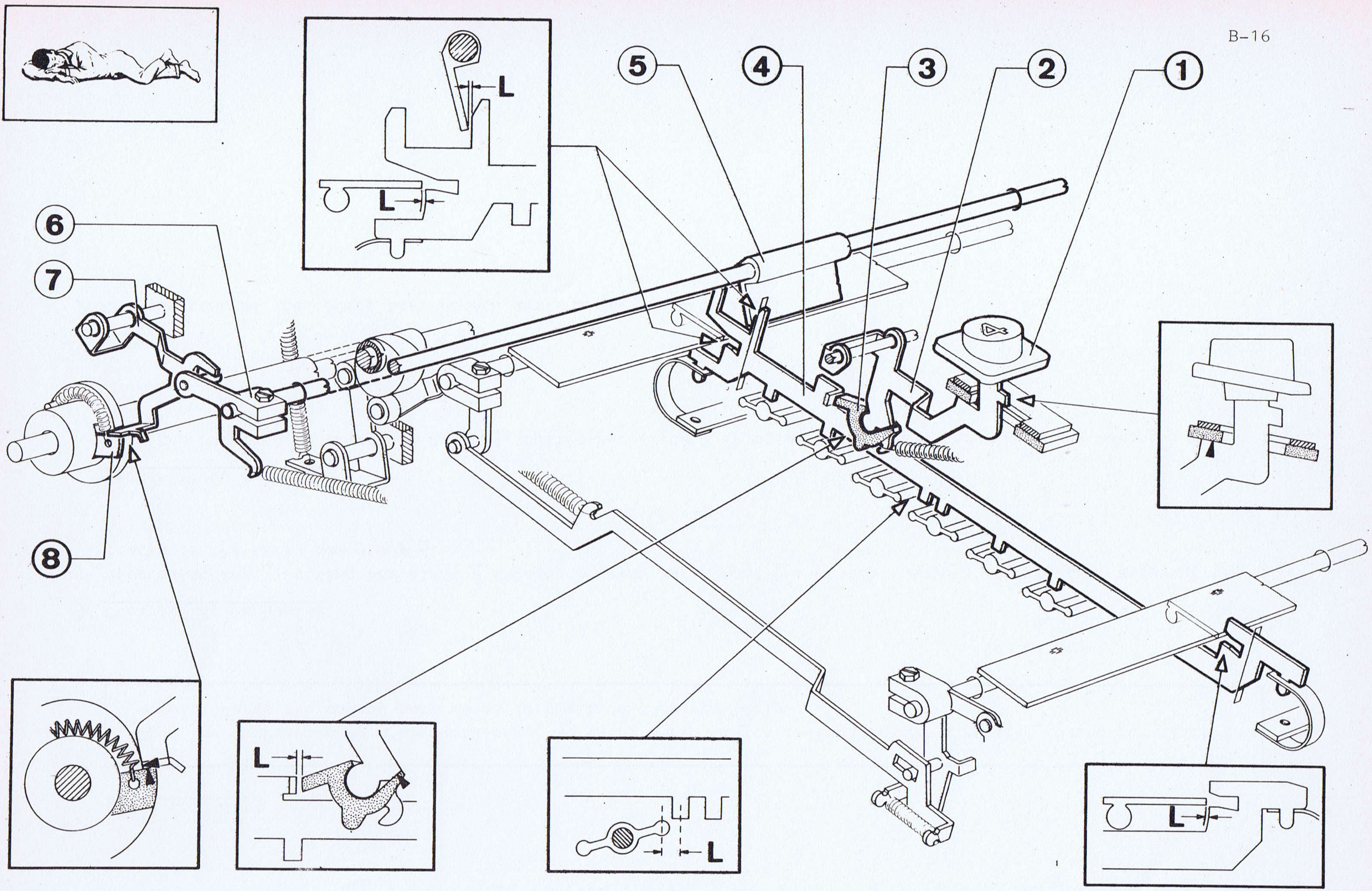
Depressing key 1, coding bar slide 2 engages setting bail 5 and 5_1. Clutch flange 3 is released, engaging the clutch of the entry cam group 4.

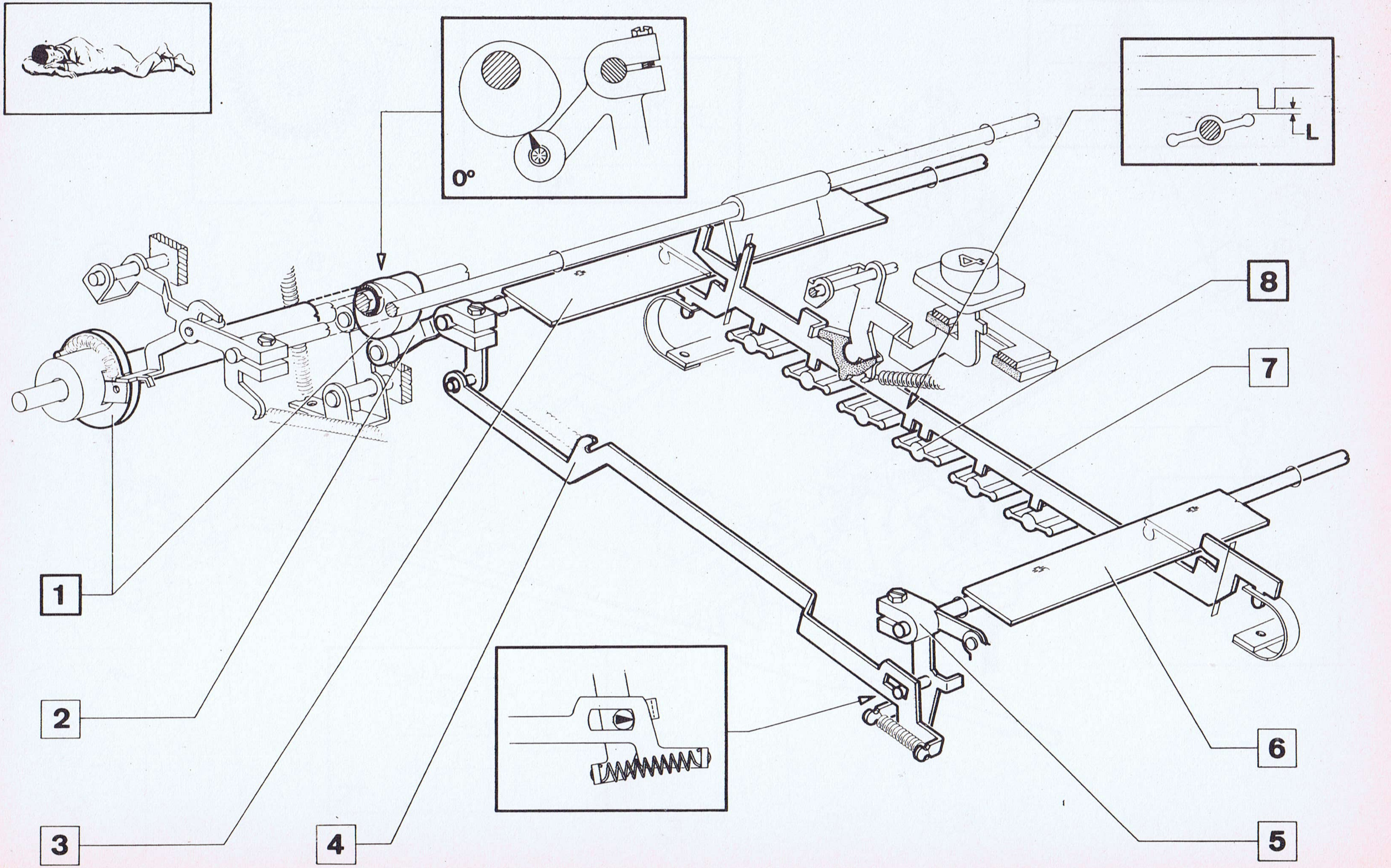
Mechanism of execution

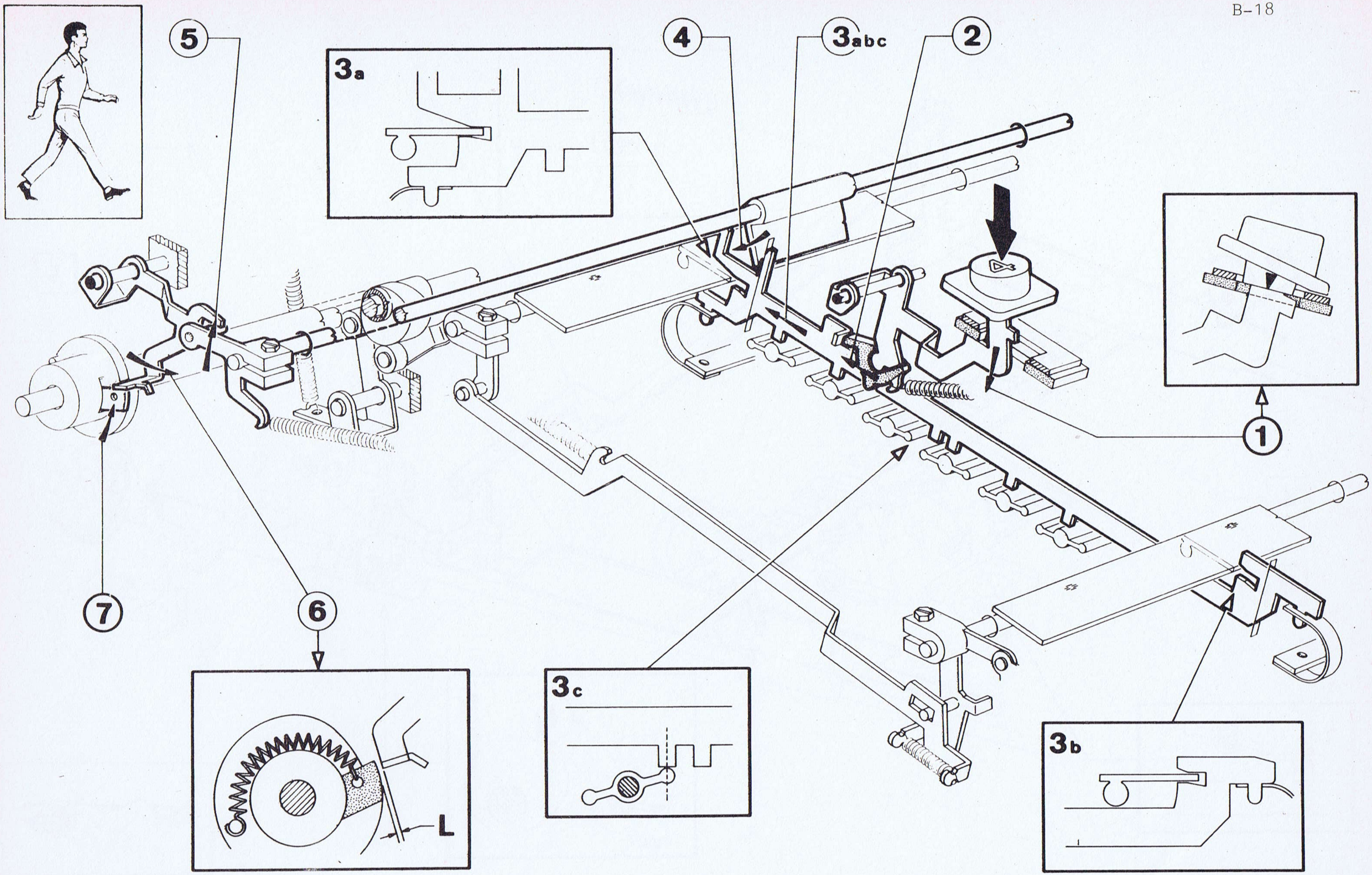
With the rotation of entry cam group 4, coding bar slide 2 is moved to position the six coding bars 6.

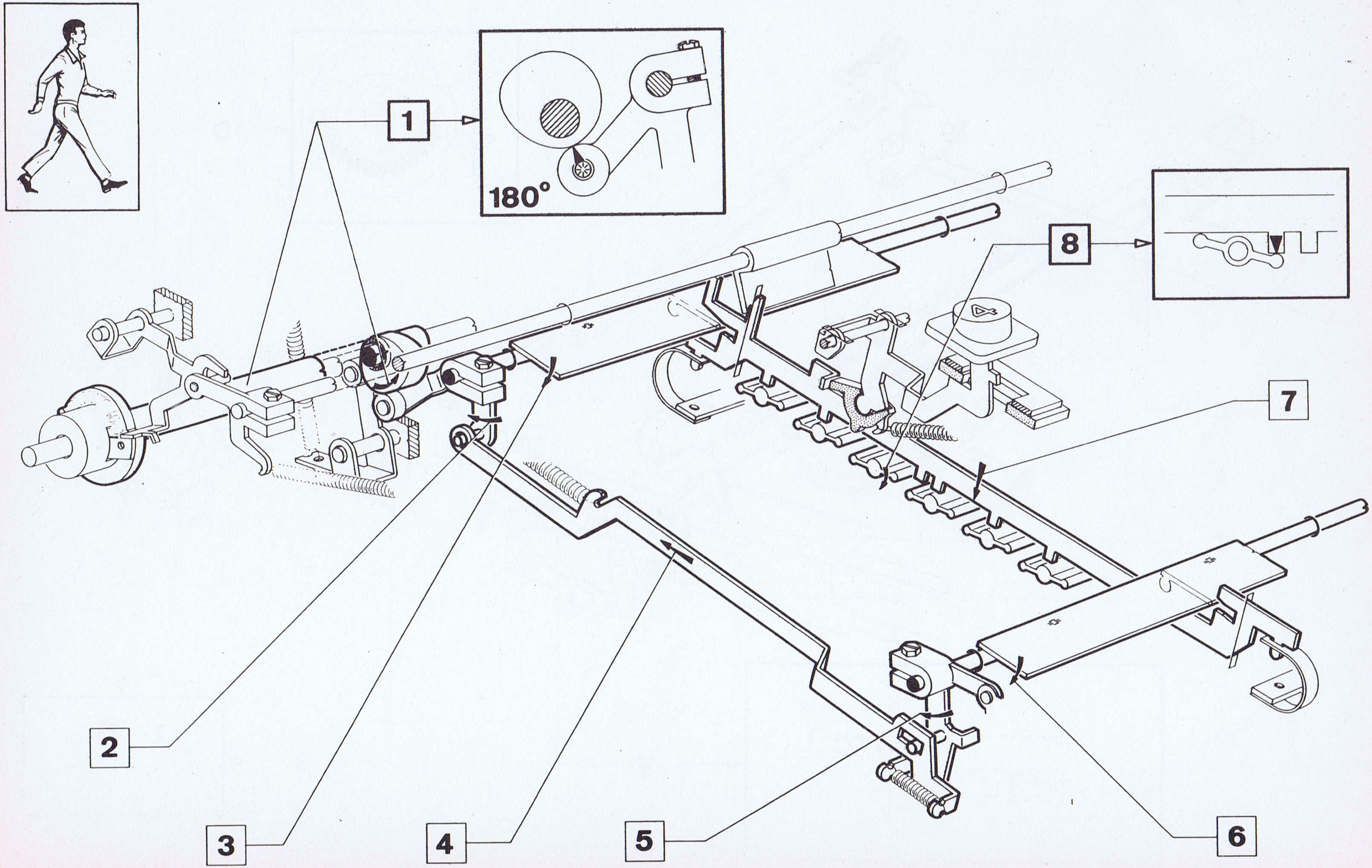
Note:

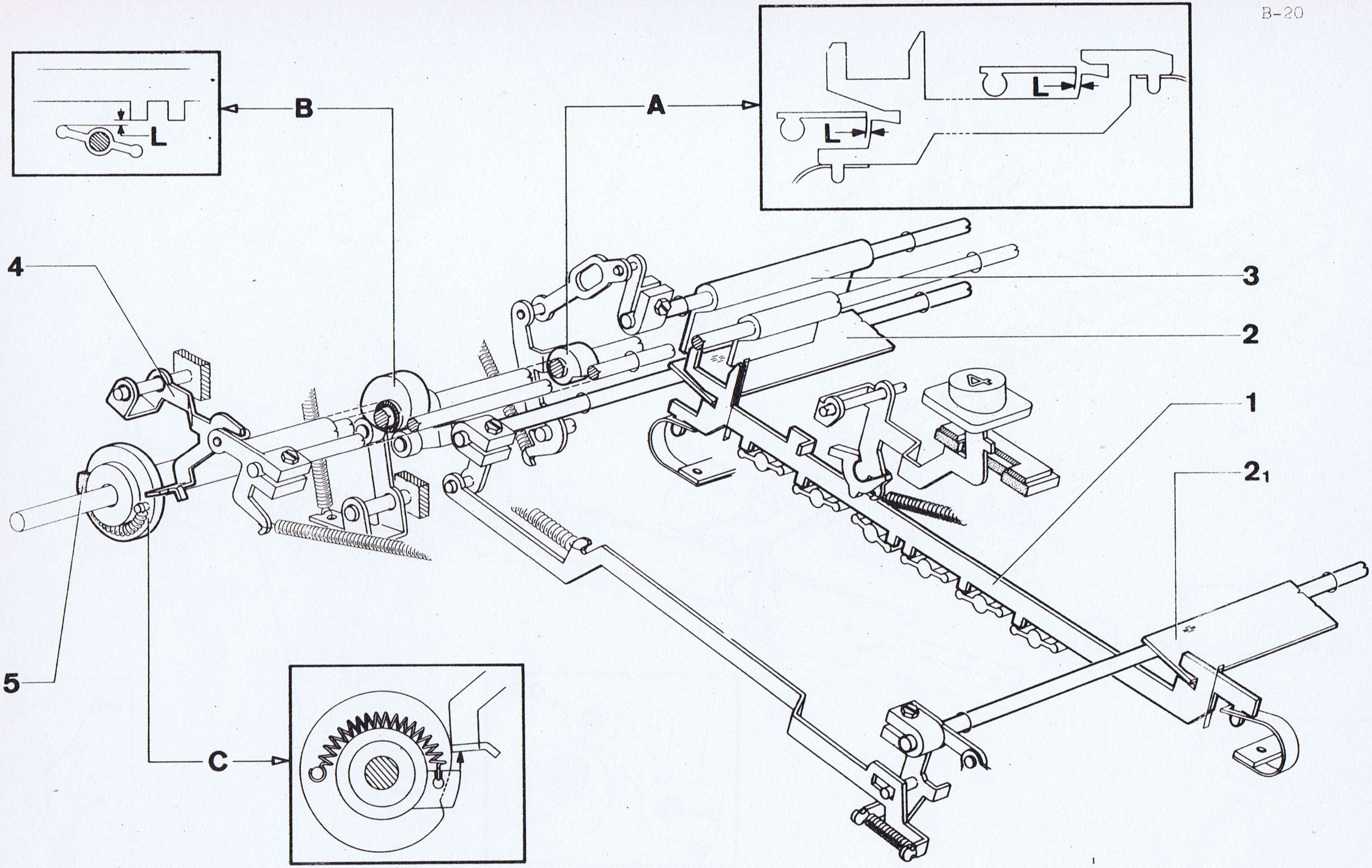
The position of the coding bars remain until a new entry is made.


⑤
④
③
②
①
⑥
⑦
⑧
L
L
L
L
L
L


0°
L


5
4
3abc
2
3a
1
7
6
3c
3b
L


180°


B
L
A
L
L
4
3
2
1
2_1
5
C

Restoring of the entry mechanism

To restore the entry mechanism it is necessary to:

- restore the selected coding bar slide to its upward position
- disengage the selected coding bar slide from the setting bails
- disengage the entry servo clutch

These functions are performed in the order shown during the 2nd 180° rotation of the servo shaft.

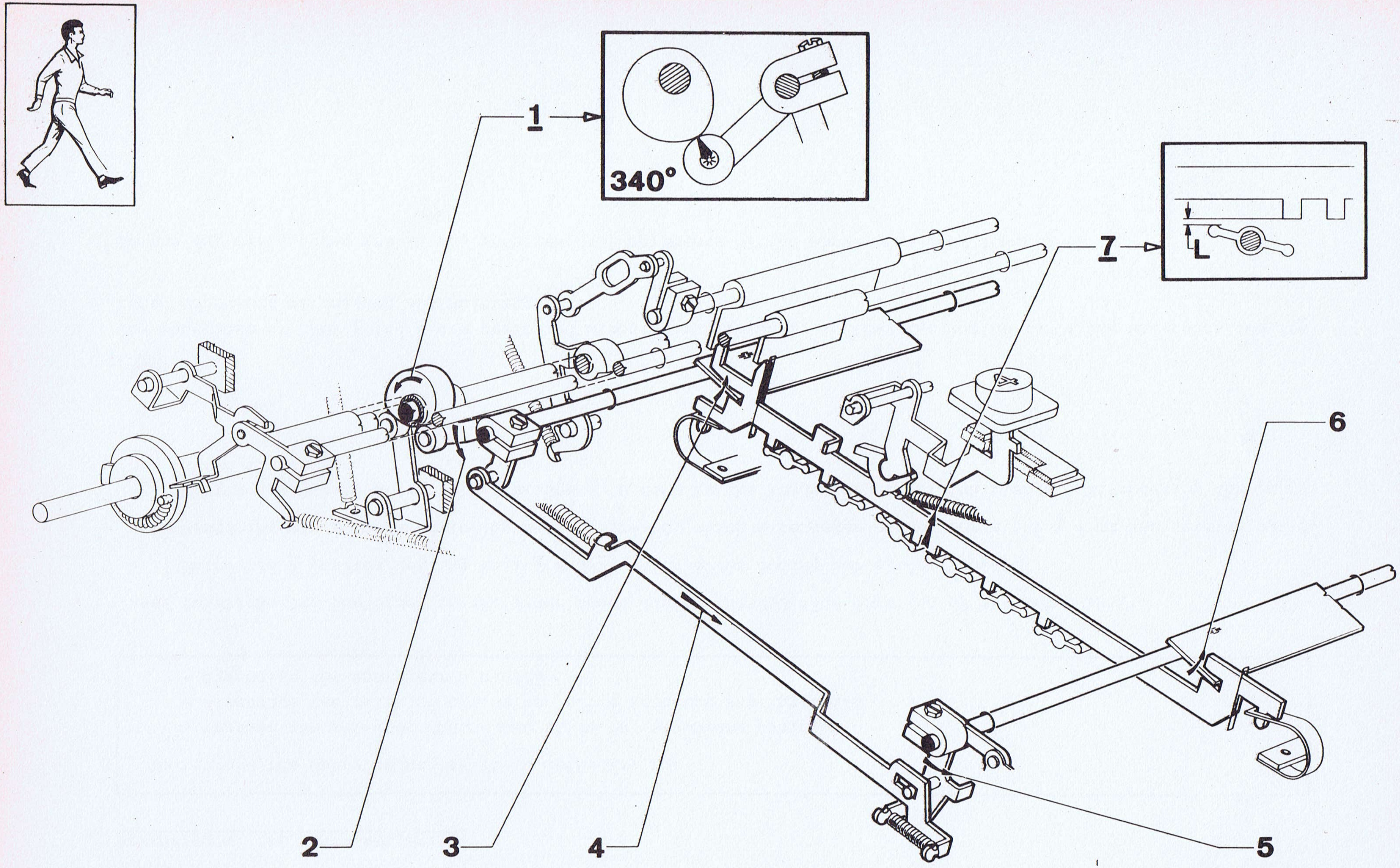
1) Entry cam B rotates setting bail 2 and 2_1 which moves coding bar slide 1 upward.
2) Restoring cam A moves restoring bail 3 forward, which disengages coding bar slide 1 from the setting bails.
3) Clutch cam C allows servo trip bridge 4 to move in the trajectory of clutch flange 5 disengaging the entry servo clutch.

Note:

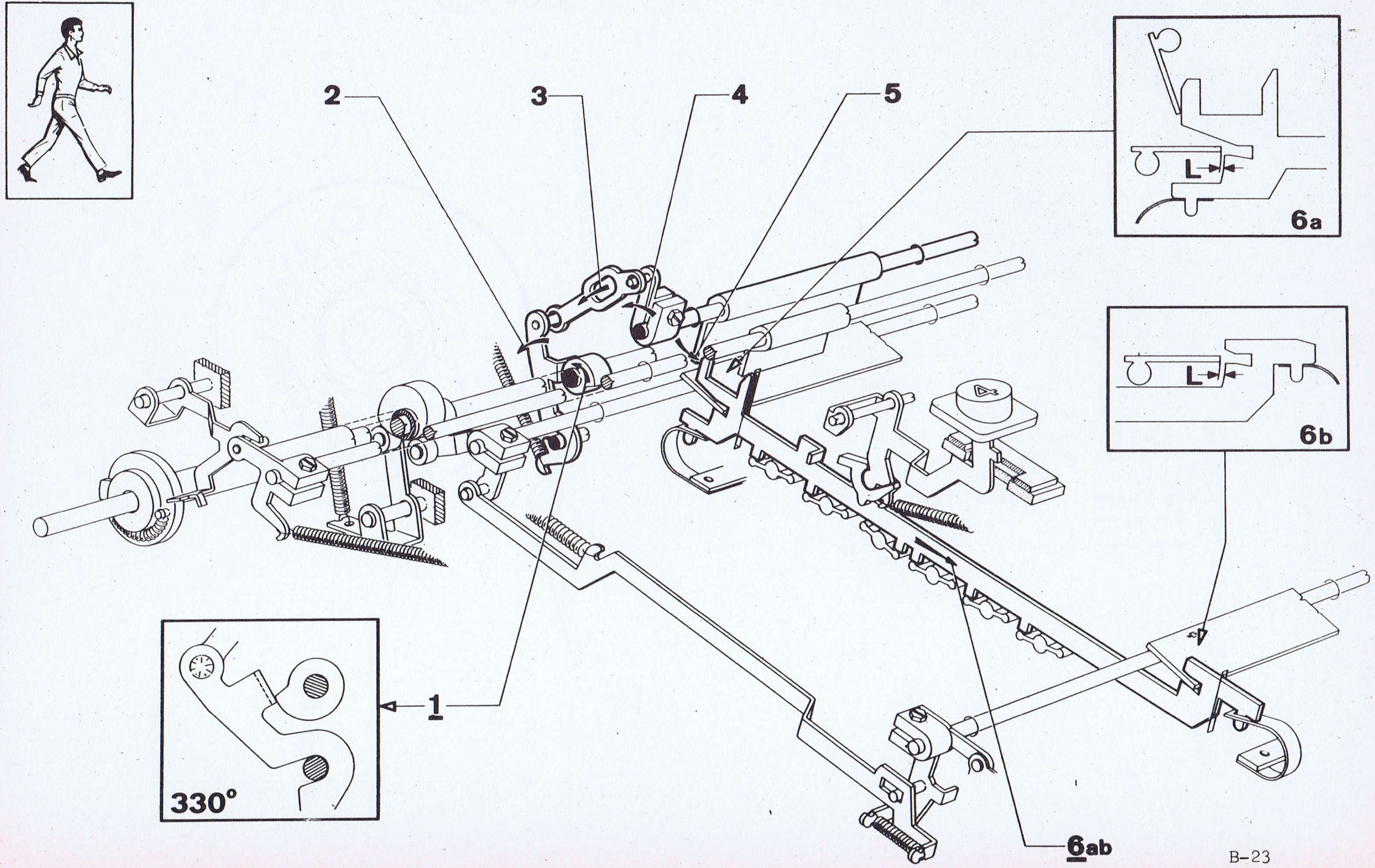
The functions of cams A and B are performed almost simultaneously so that the coding bar slide undergoes two combined movements of raising and shifting forward.

On the following pages are shown, in order, the movements of the above mentioned functions.

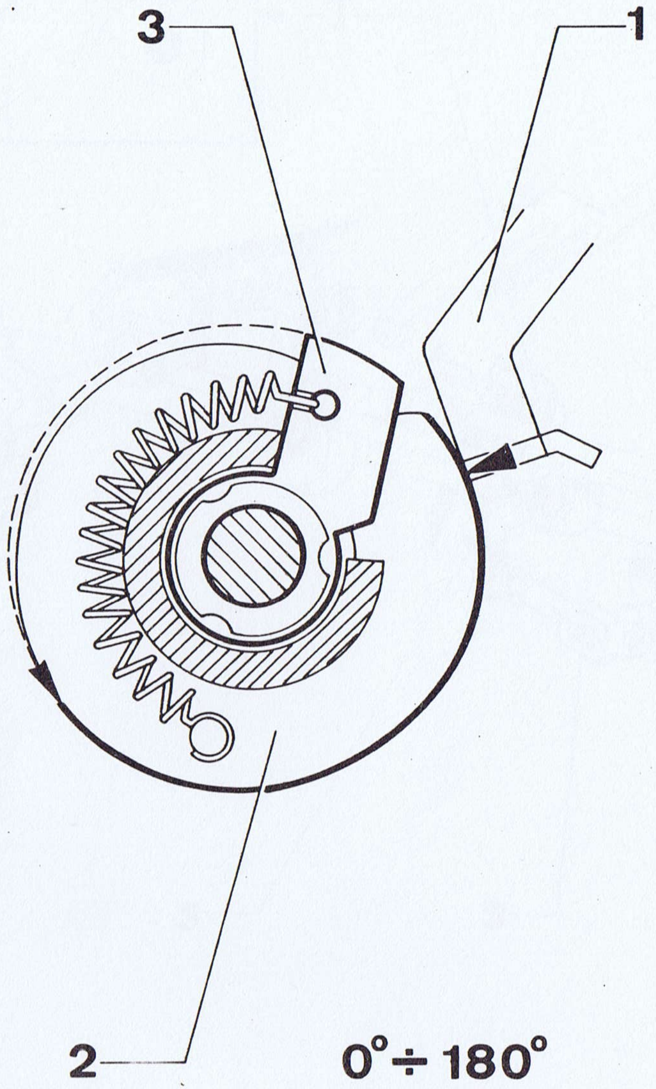
Restoring of the "coding bar slide" to its upward position



Disengagement of the "coding bar slide" from the setting bails

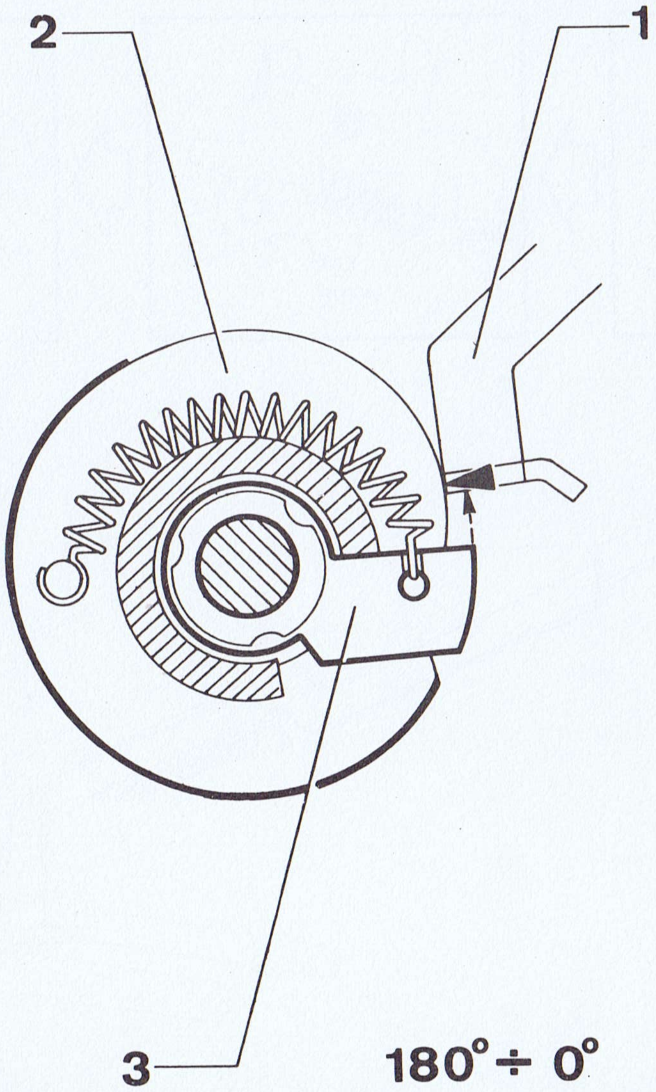


Disengagement of the entry servo clutch



With the entry servo clutch engaged, servo trip bridge 1 is controlled by the circular profile (drawn in heavy ink) of clutch cam 2.

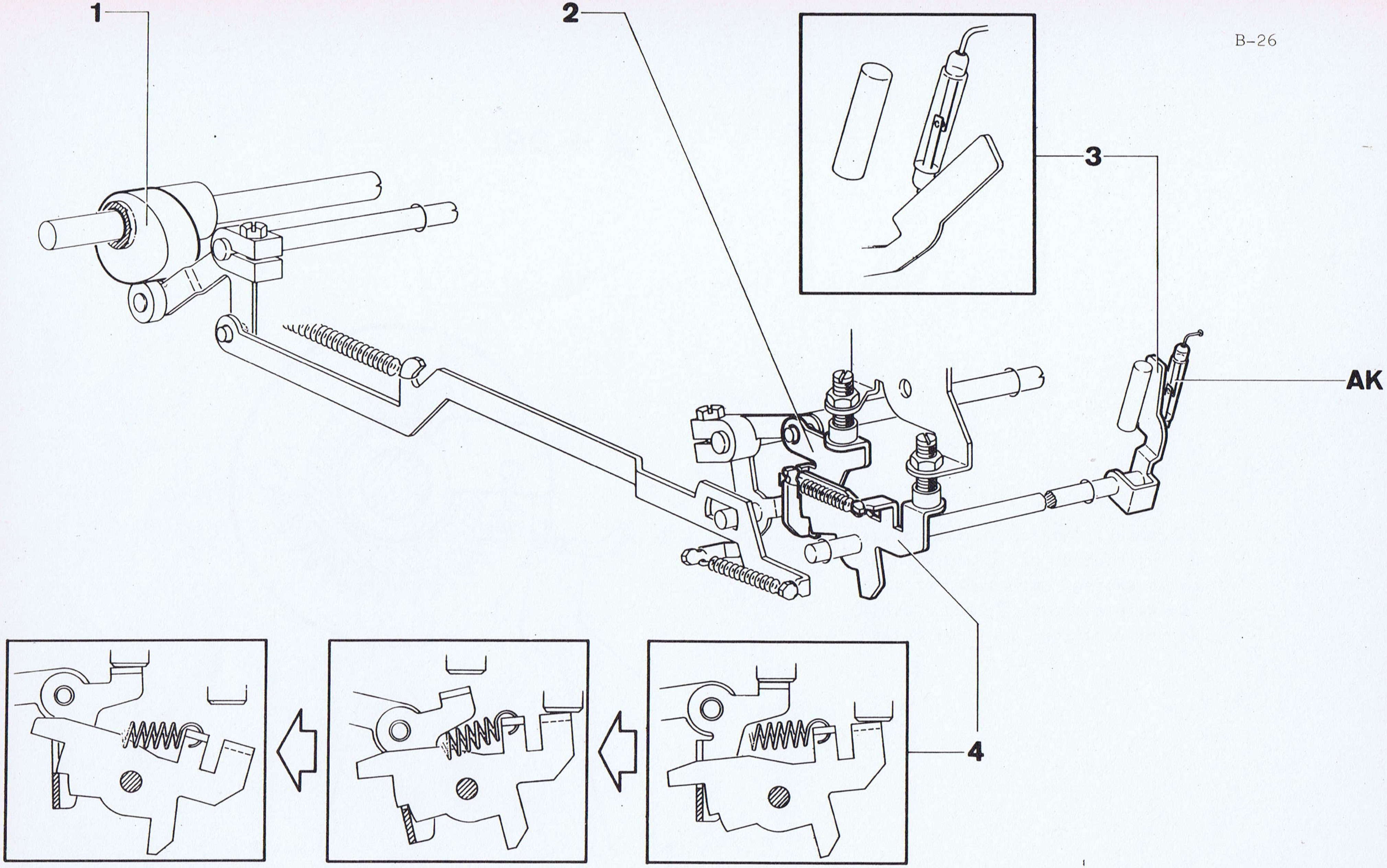
In this condition servo trip bridge 1 is out of the trajectory of clutch flange 3.



180° ÷ 0°

During the last 180° rotation of clutch cam 2, the diminishing profile of the cam allows servo trip bridge 1 to return in the trajectory of "clutch flange" 3.

The clutch will disengage.


AK

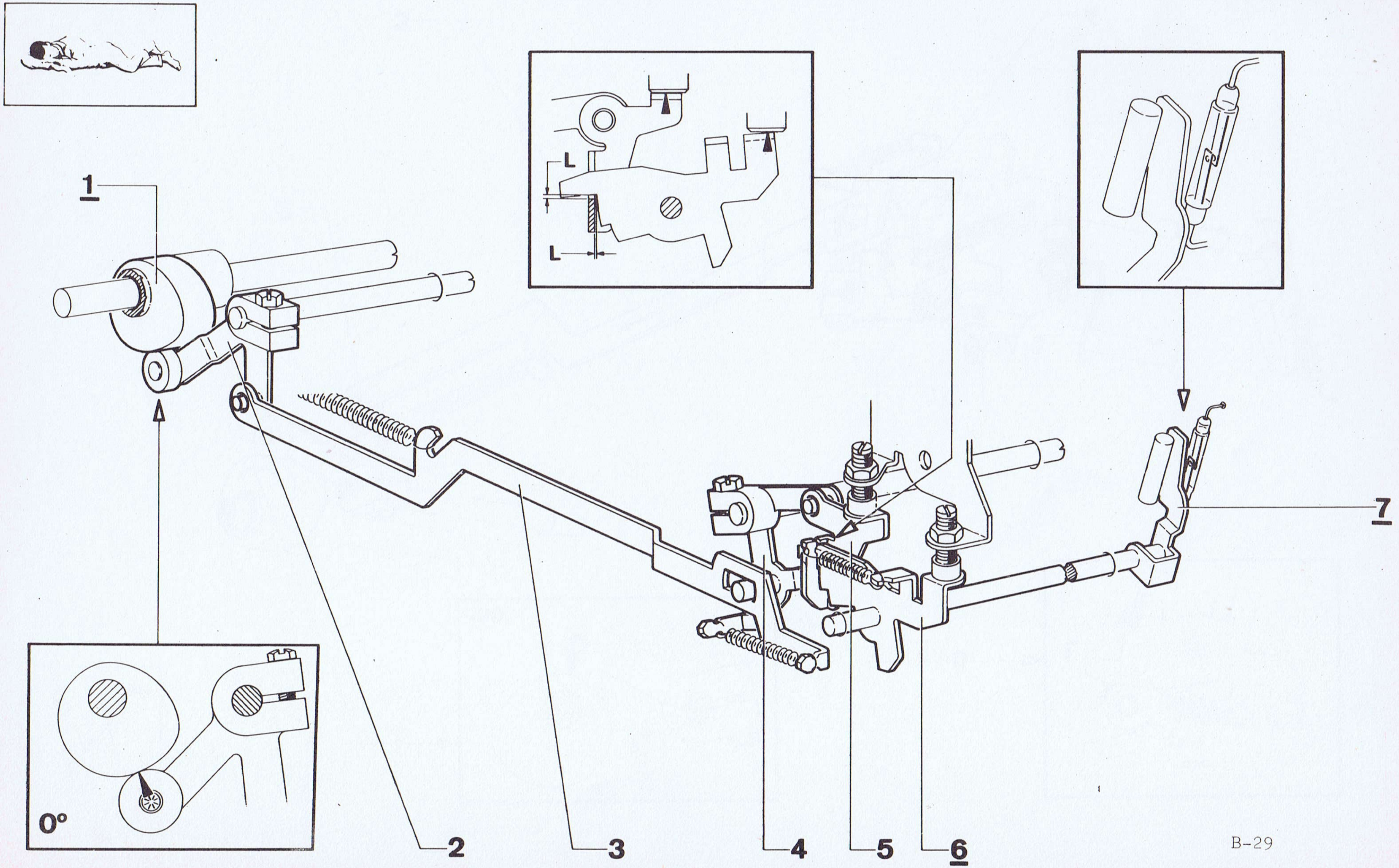
Coding validation (AK)

After the positioning of the six coding bars (by the "coding bar slide"), the AK Reedswitch is closed.

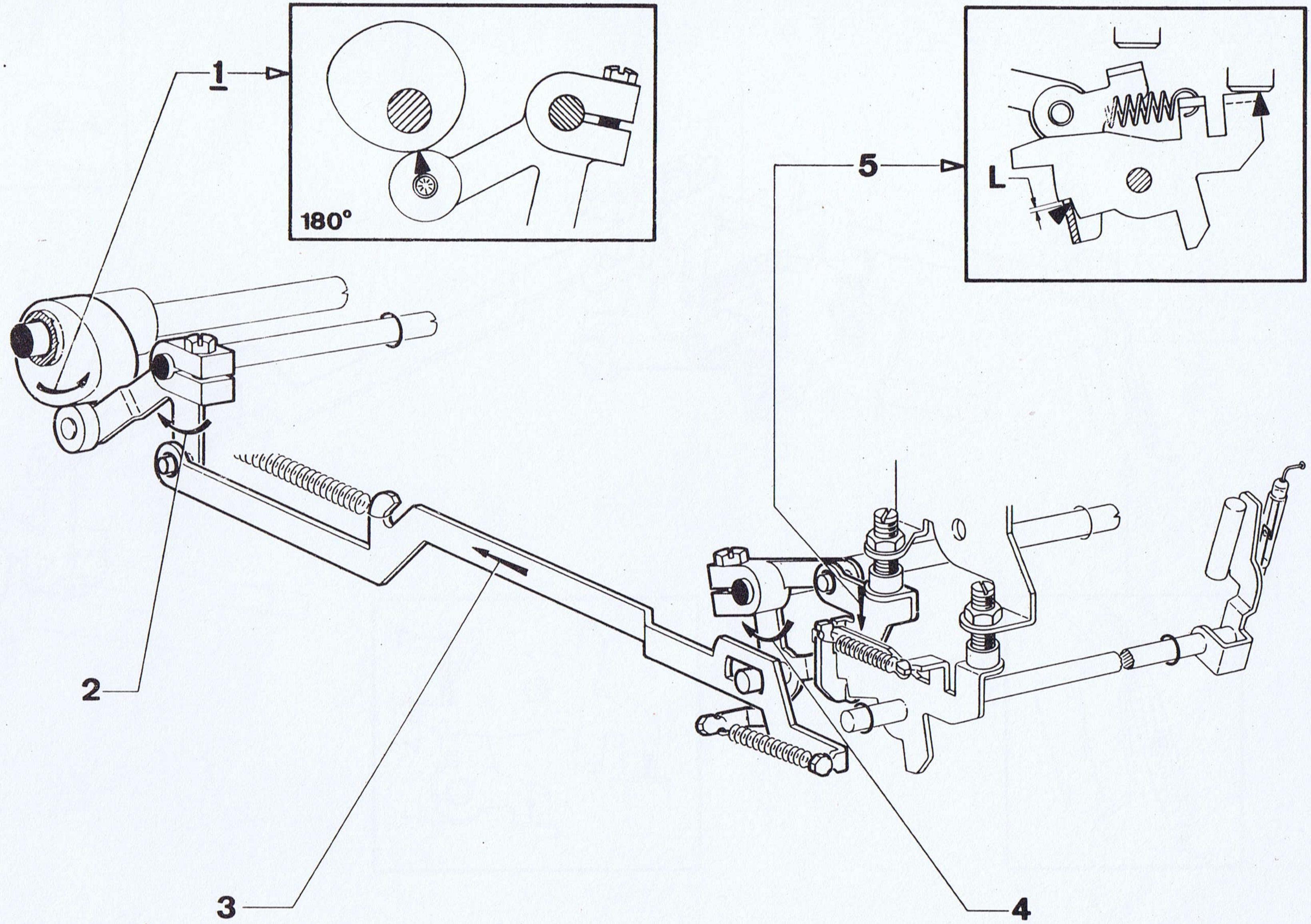
Through the rotation of entry cam 1, AK control plate 4 is raised by AK control latch 2 removing screen 3 from the AK Reedswitch.

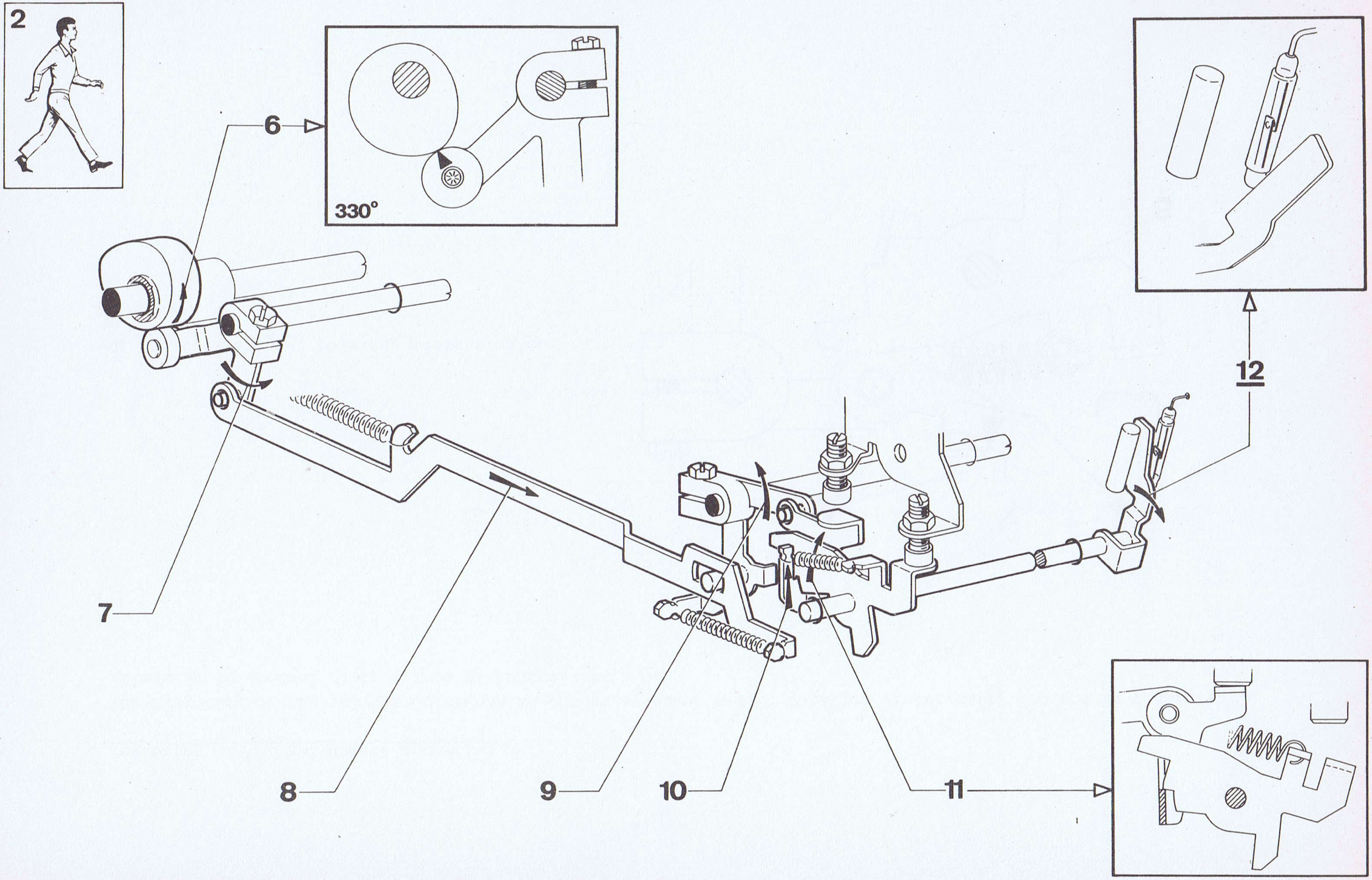
Note:

The closing of the AK Reedswitch is not permanent as it is for the "code Reedswitches".
AK control plate 4 is automatically released from AK control latch 2 at the end of the same entry cycle.


L
L
0°

1

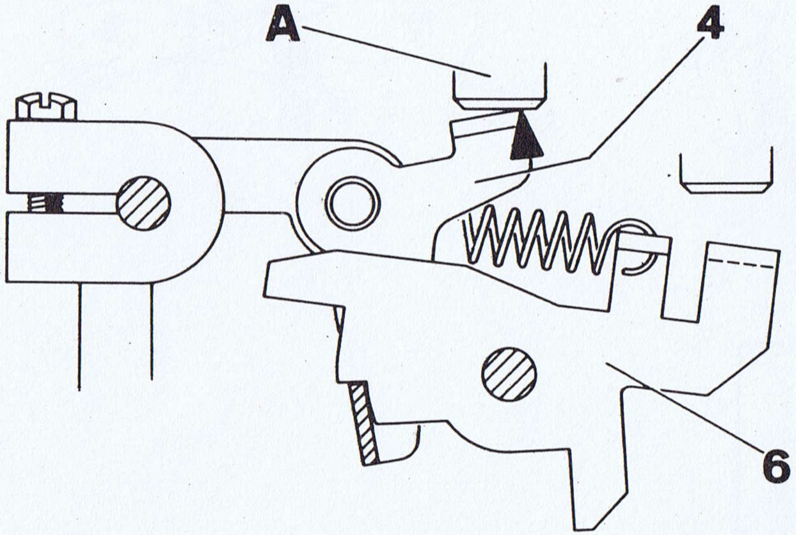

1
180°
5
L
2
3
4


330°

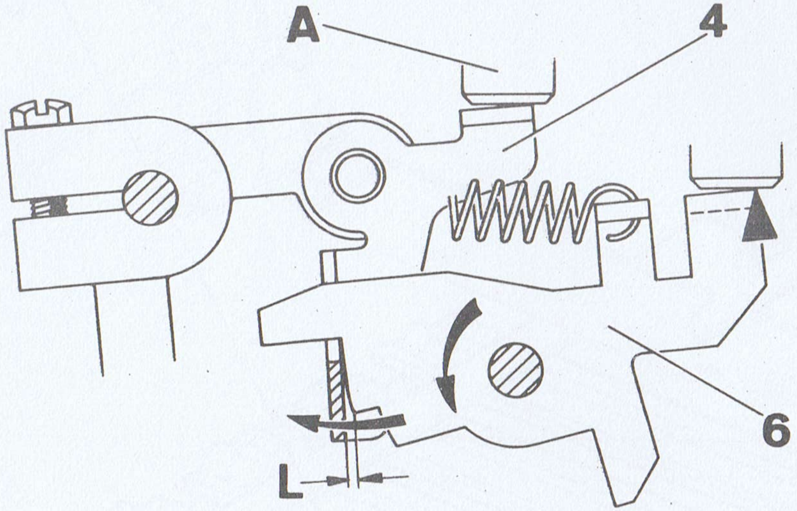
Restoring of the validation mechanism

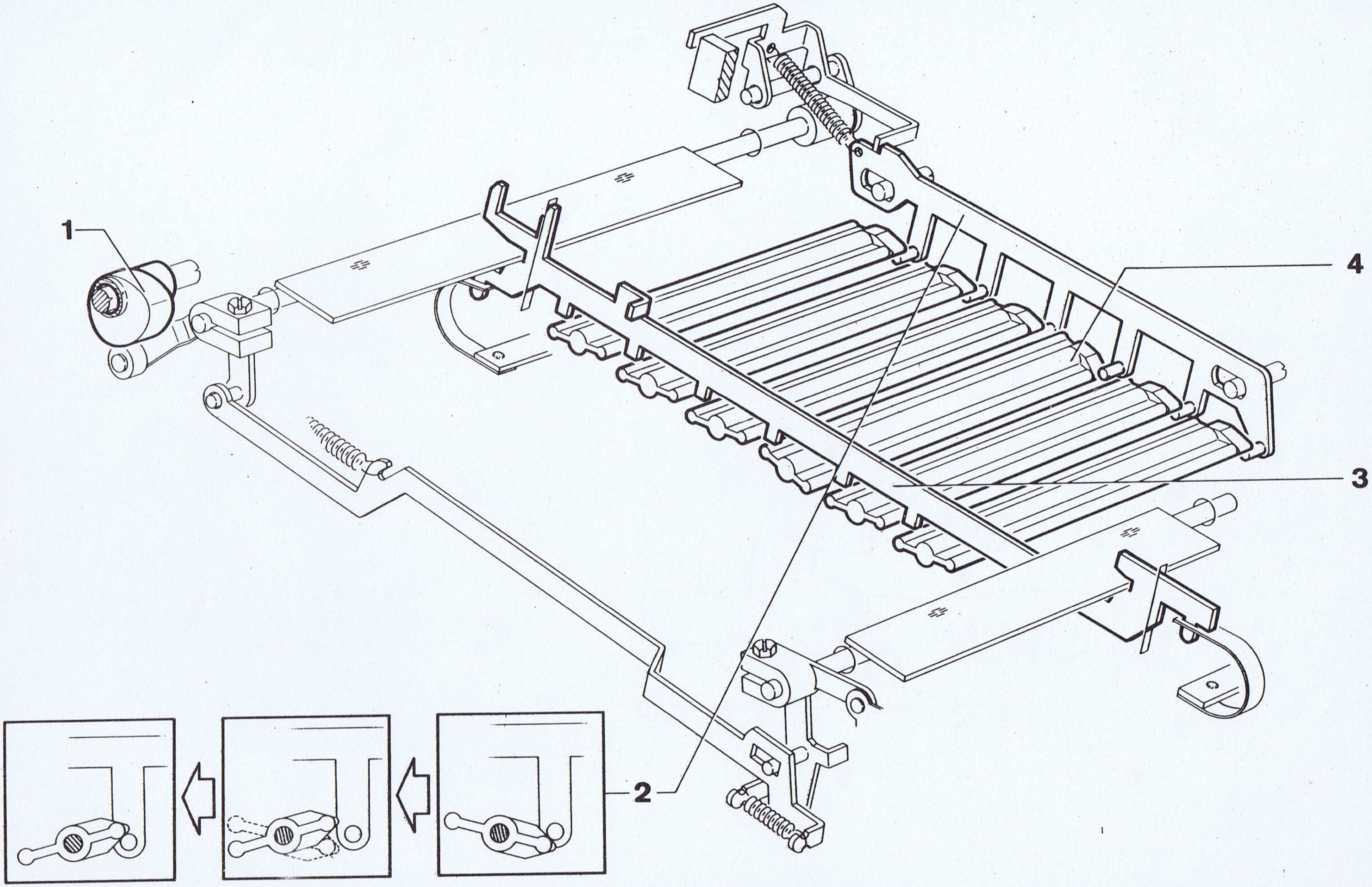
The restoring of the validation mechanism occurs at about a 340° rotation of the entry cam and it consists in releasing AK control plate 6 from AK control latch 4.

AK control latch 4, raising, meets stop A.



Pivoting on stop A, AK control latch 4 rotates in the direction of the arrow releasing AK control plate 6.





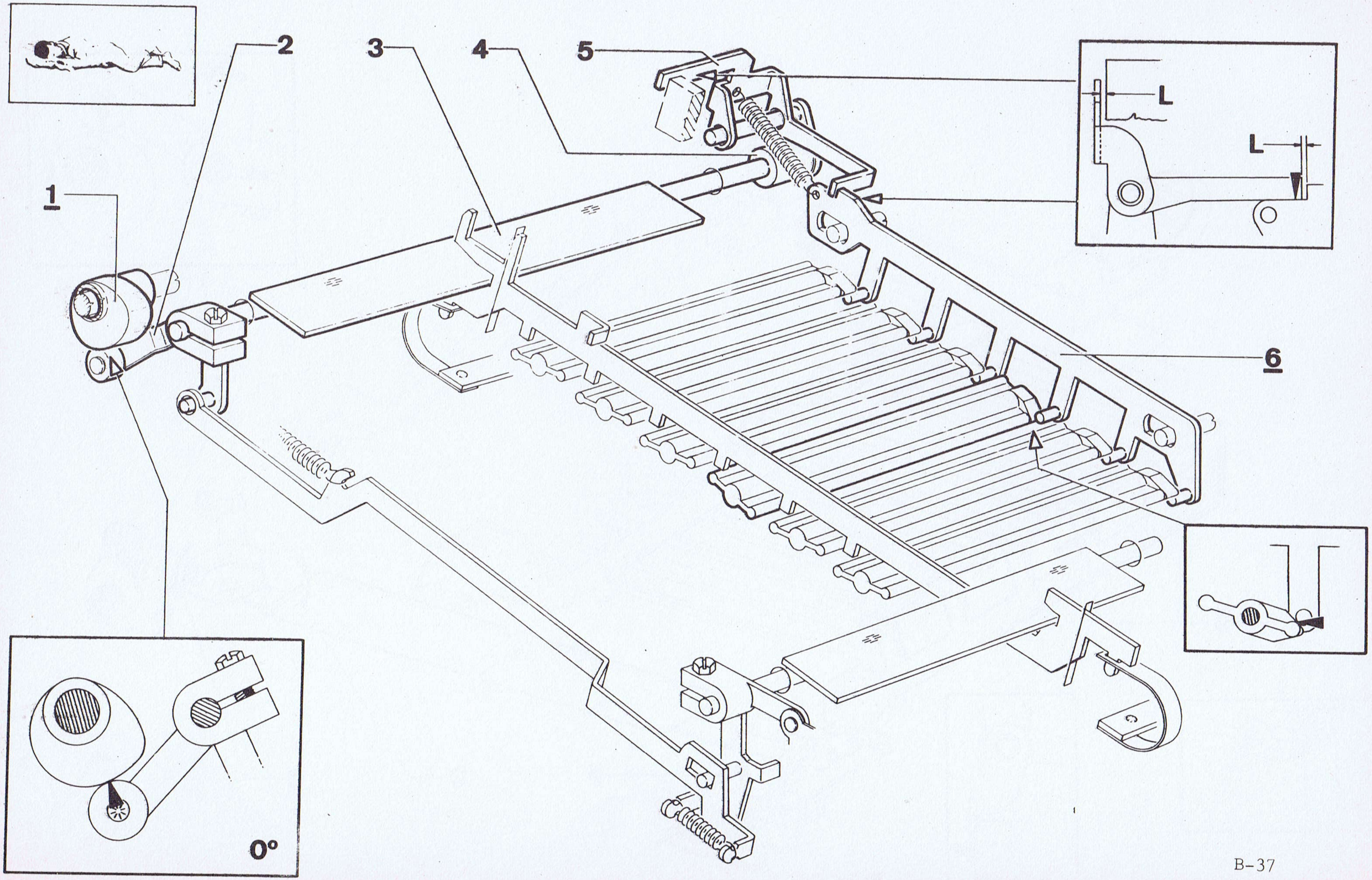
Locking of the coding bars

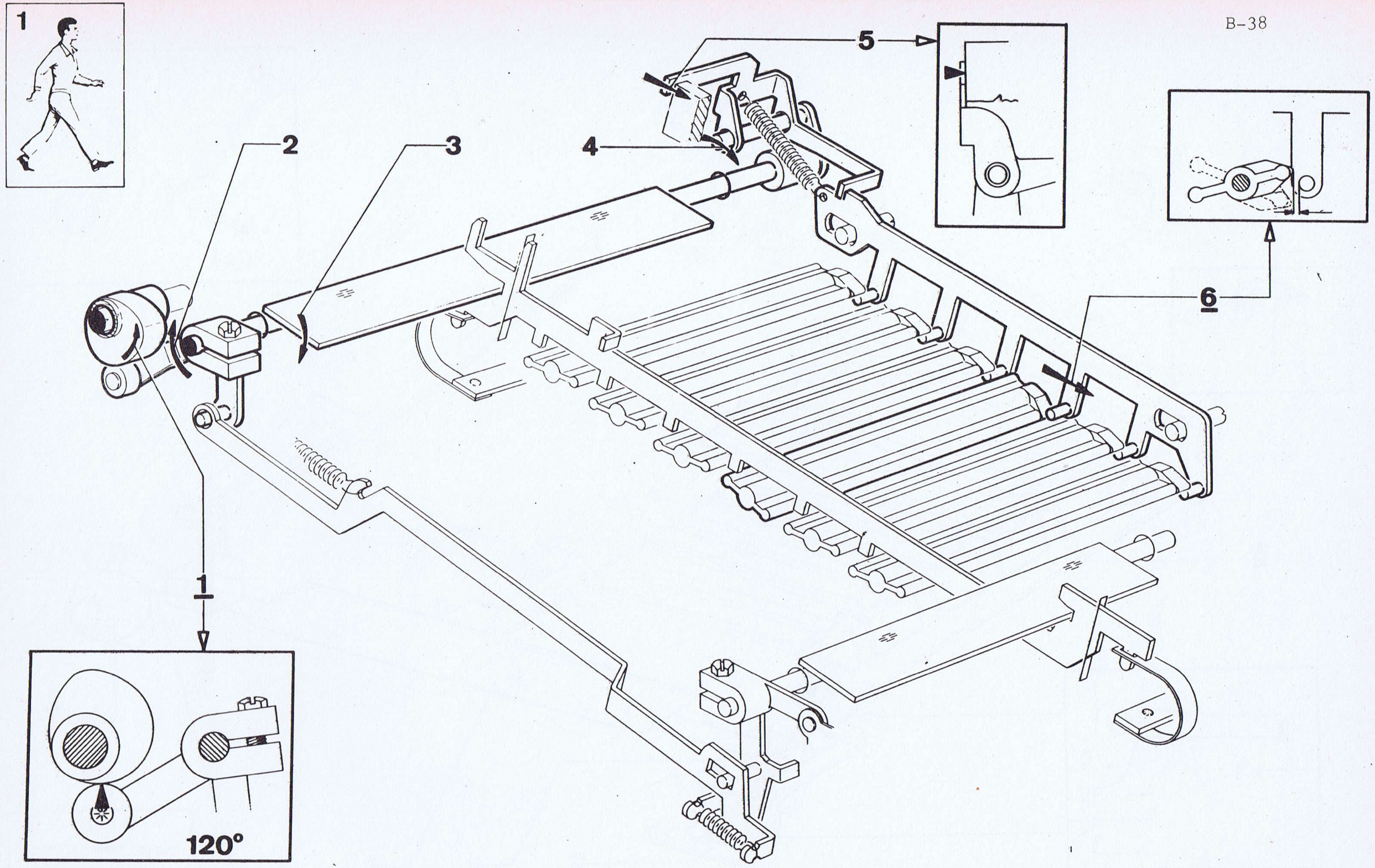
Because the validation of the coding occurs during the restoring of the entry mechanism, it is necessary to maintain the position given to the coding bars even during the upper travel (return) of the coding bar slide.

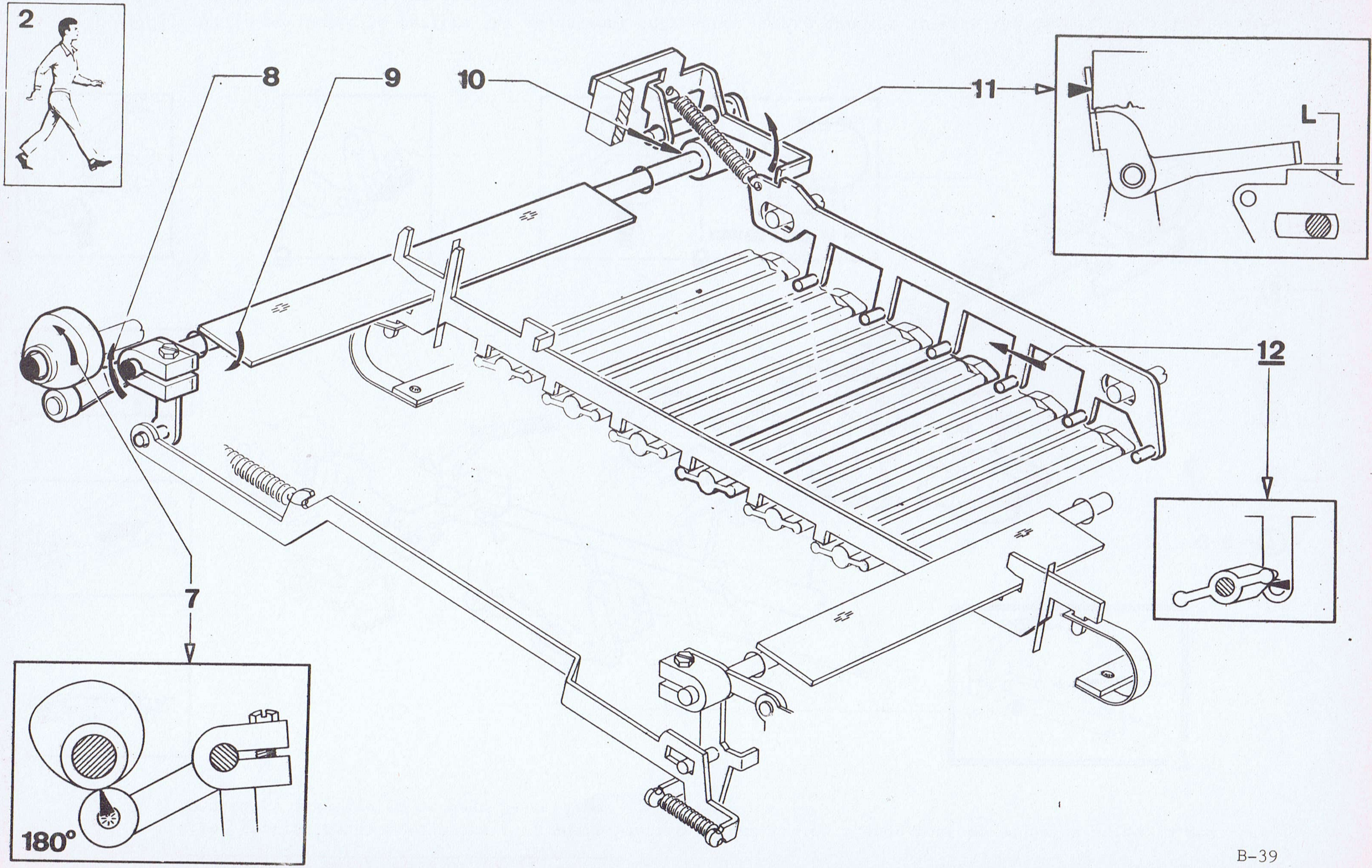
Through the rotation of entry cam 1, coding bar positioner 2 must perform in the order of the following two functions:

- release "coding bars" 4 to allow positioning by "coding bar slide" 3.
- lock "coding bars" 4 in the position given by "coding bar slide" 3.

In the following figures the "coding bar slide" is shown already engaged with the two setting bails.

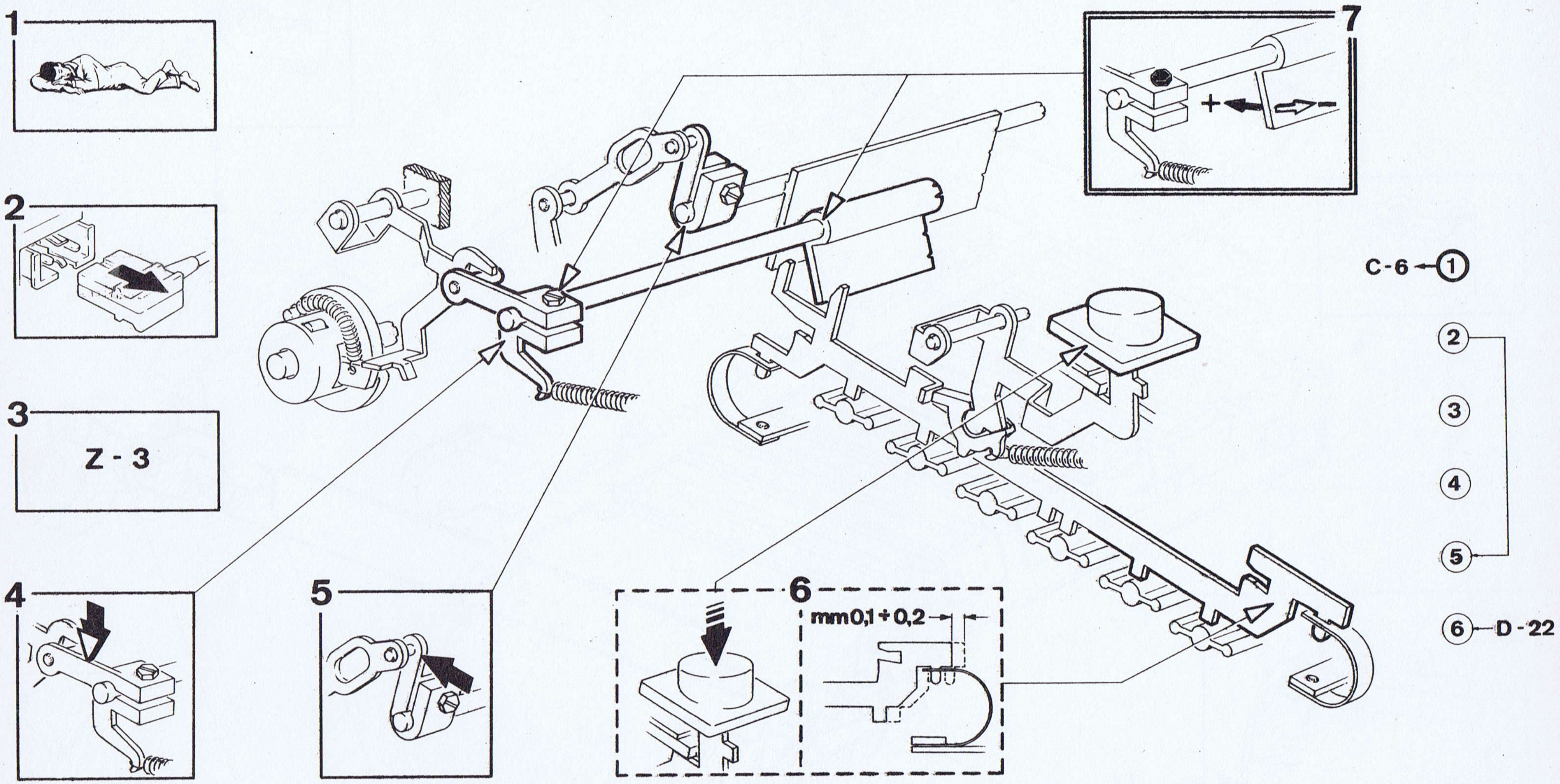

L
L
0°


120°


L
180°

ADJUSTING THE ENTRY SERVO CLUTCH ENGAGEMENT

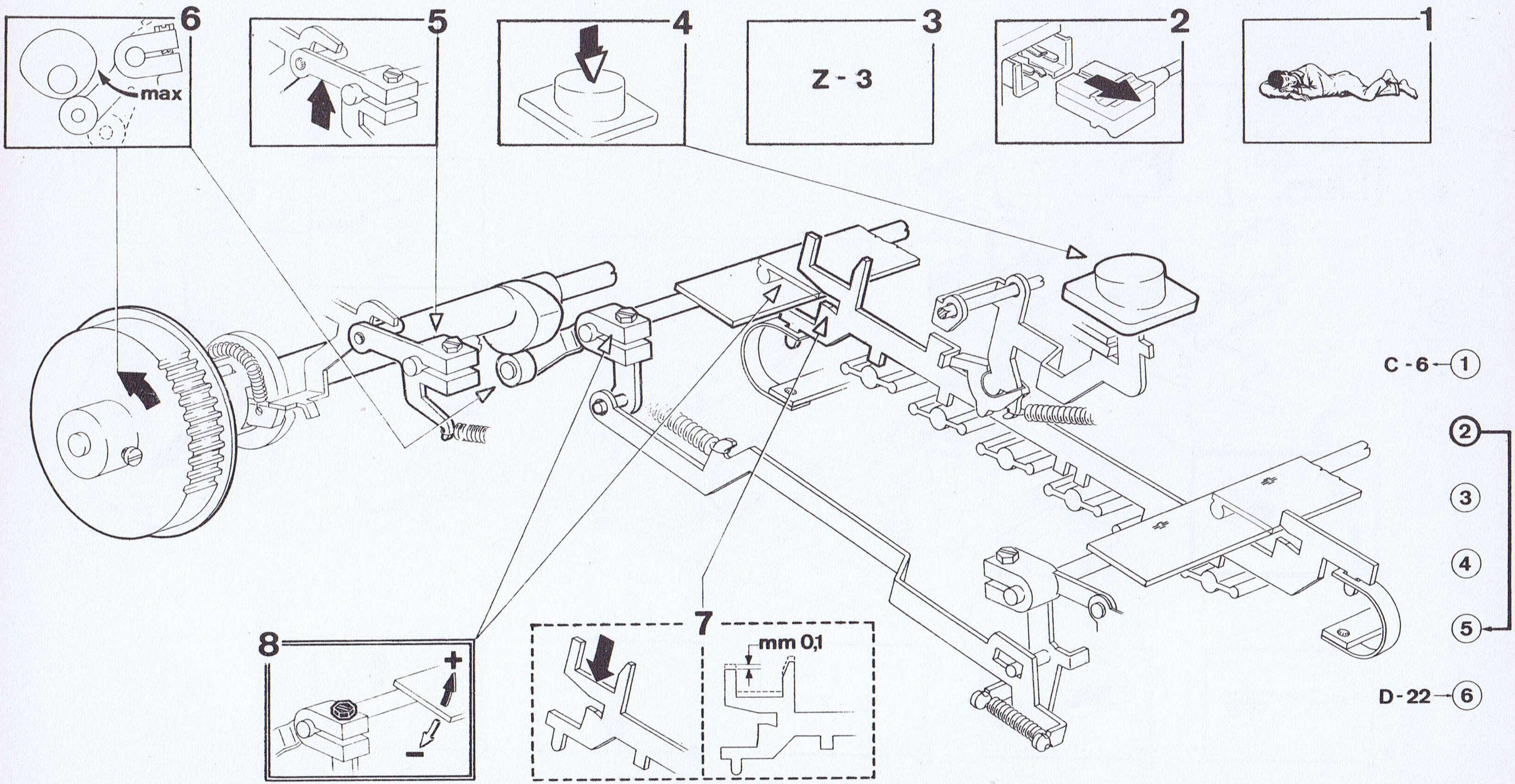
After depressing each keyboard key, the releasing of the clutch flange must be adjusted so as to meet the conditions illustrated on page B-14 (frame 3).



NOTE: It is advisable to perform the adjustment only after having checked it with the depression of key located at the extremes and in the center of the keyboard (Z-3, manual release of the keyboard).

ADJUSTING THE ANGULAR POSITION OF THE REAR SETTING BAIL

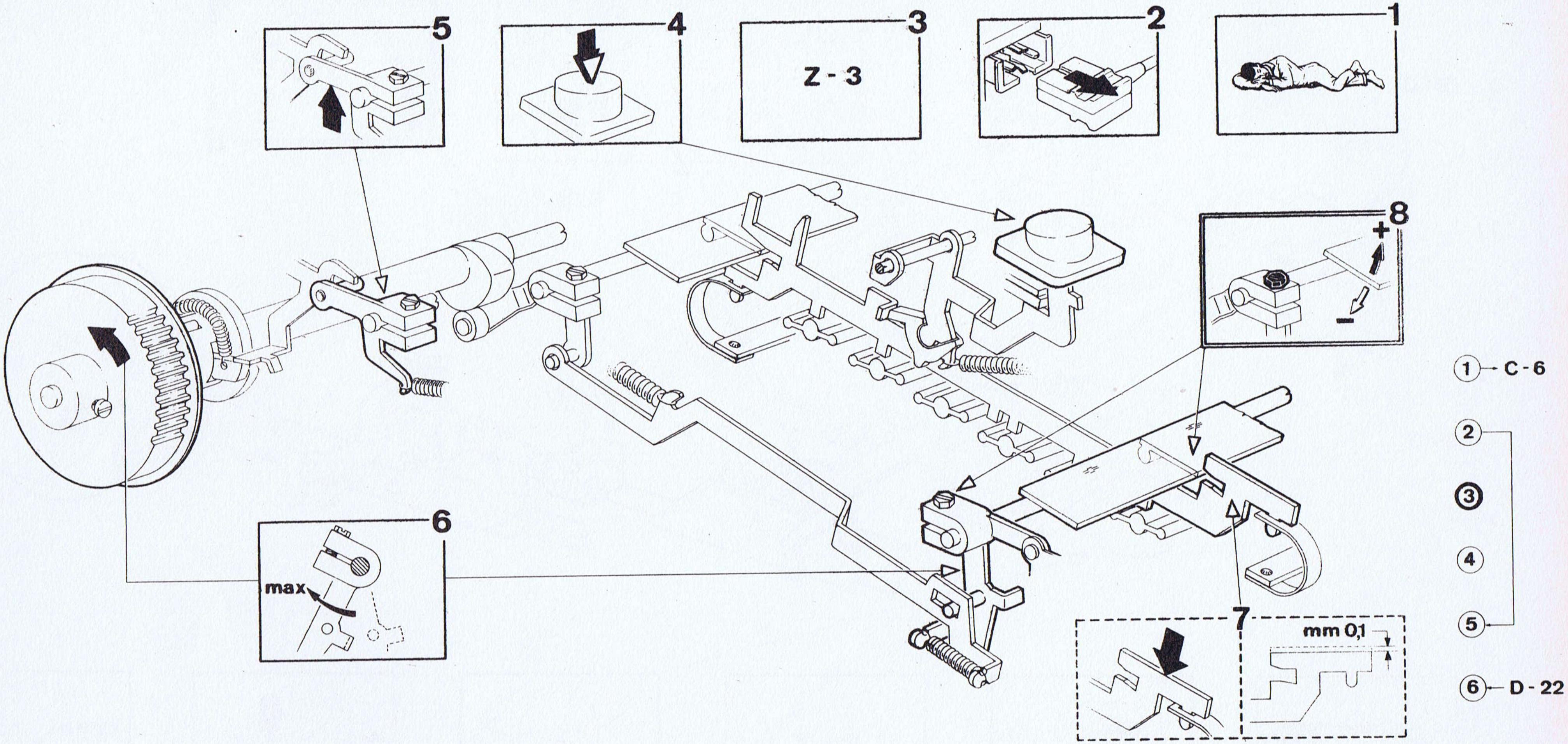
The Rear Setting Bail must move the rear portion of the Coding Bar Slide to the maximum downward position.



(Z-3, manual release of the keyboard)

ADJUSTING THE ANGULAR POSITION OF THE FRONT SETTING BAIL

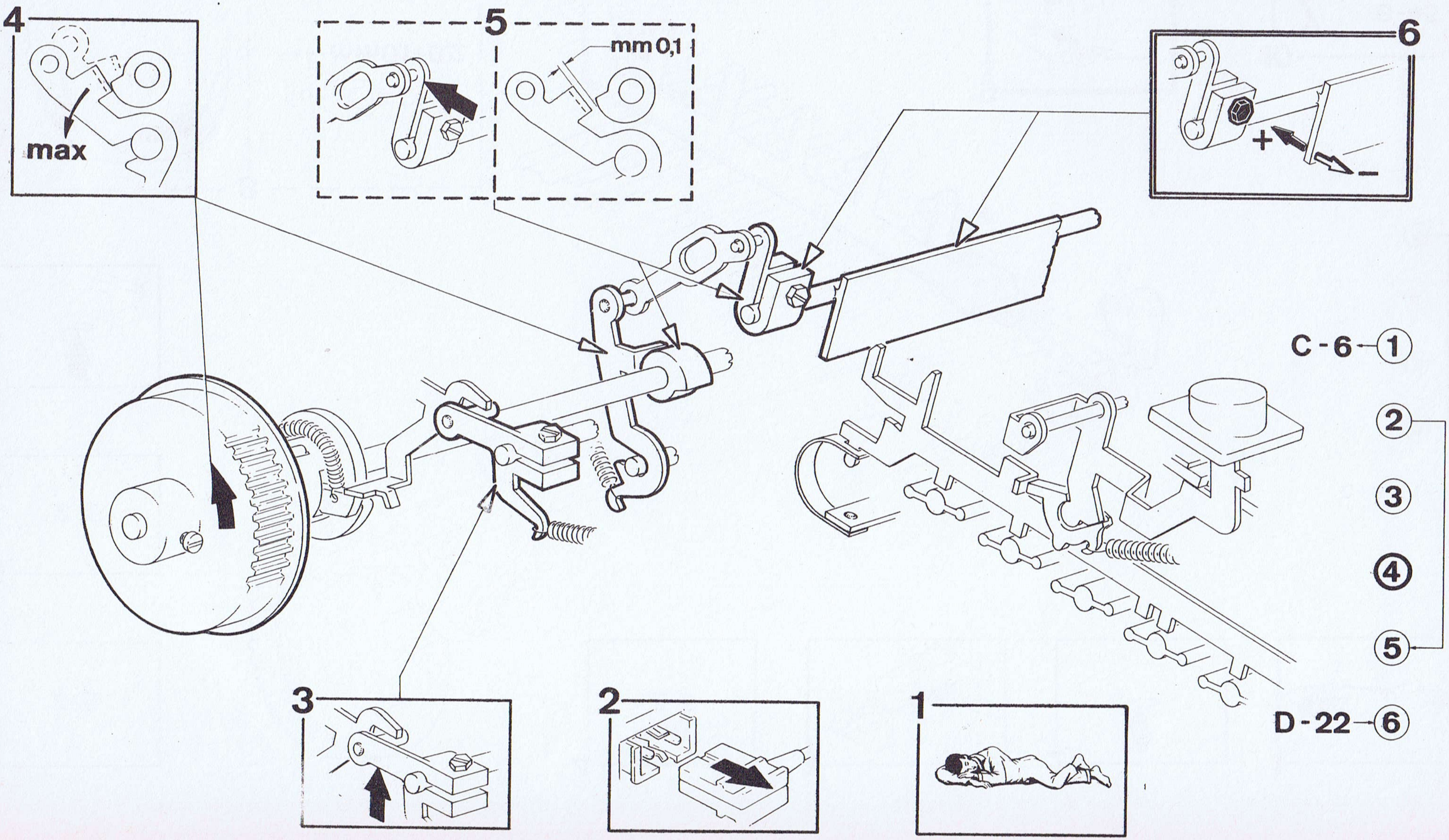
The Front Setting Bail must move the front portion of the Coding Bar Slide to the maximum downward position.



(Z-3, manual release of the keyboard)

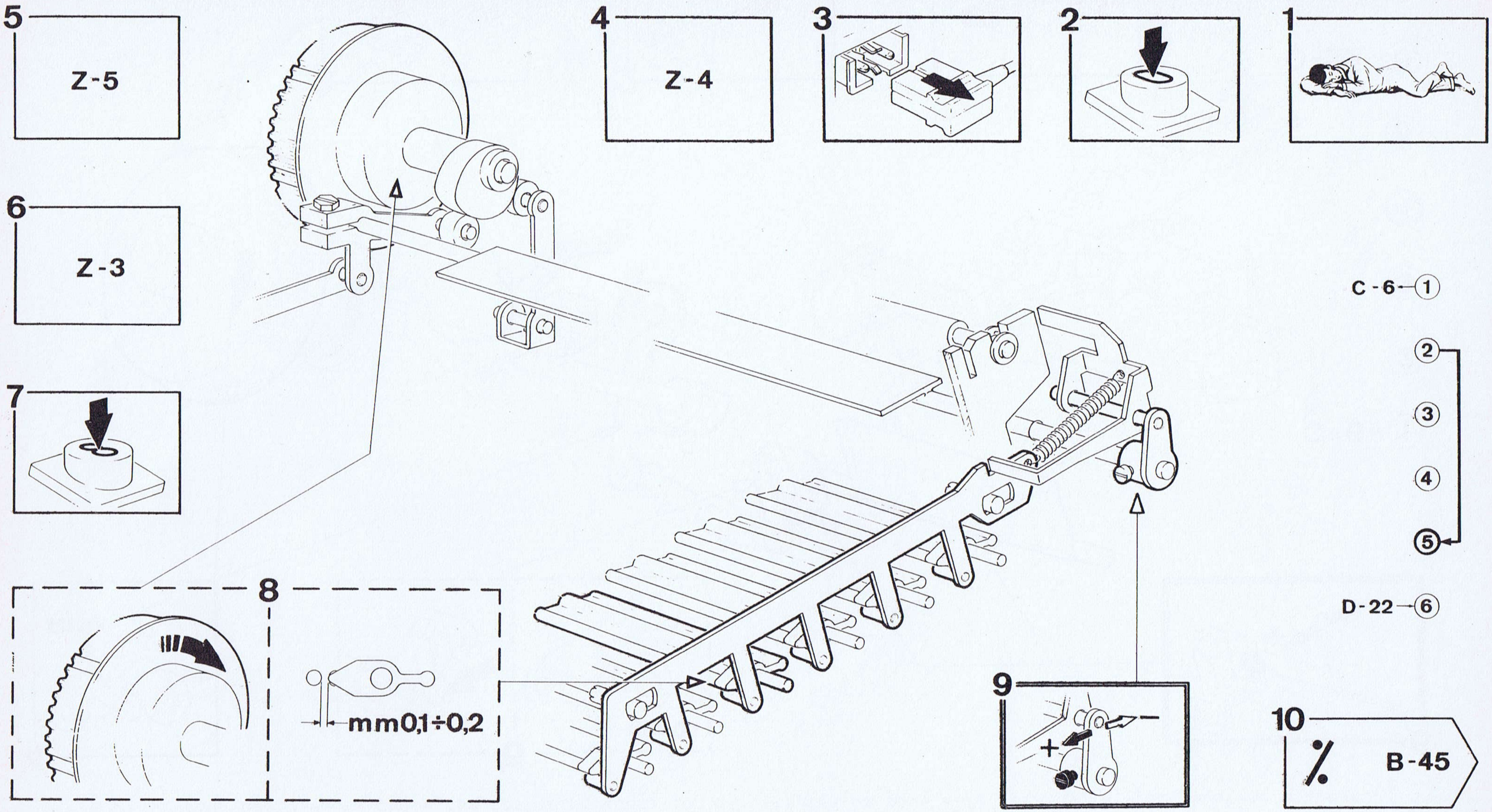
ADJUSTING THE AMOUNT OF TRAVEL OF THE RESTORING BAIL

During every entry cycle the restoring condition illustrated on page B-23 (frames 6a - 6b) must be achieved.



ADJUSTING THE CODING BAR LOCK MECHANISM

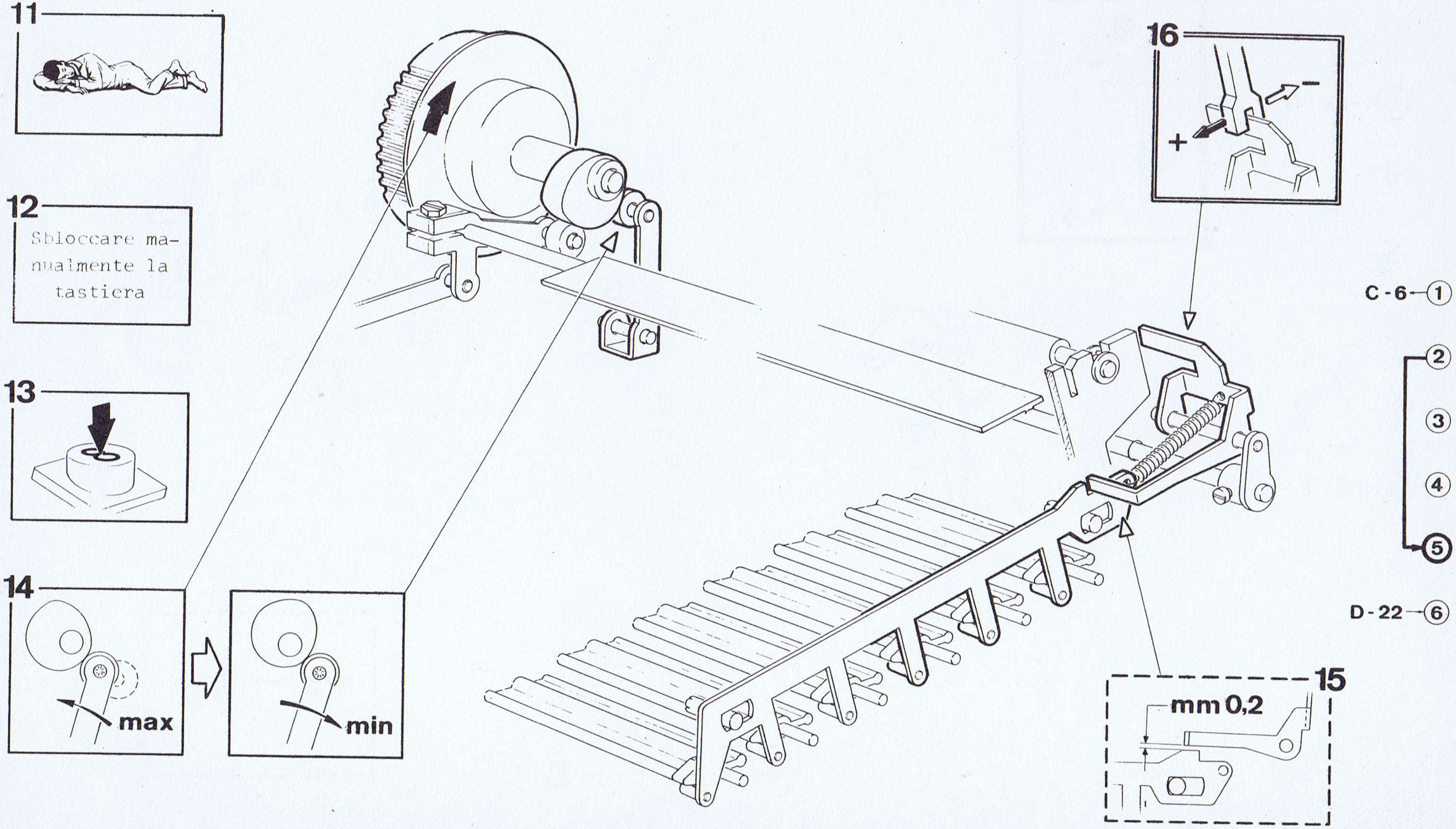
During every entry cycle the condition illustrated on page B-34 (frame 2) must be achieved in the order shown.



(Z-3, Manual release of the keyboard)
(Z-5, Removal of the Reedswitch Board)

(Z-4, Removal of the keyboard)

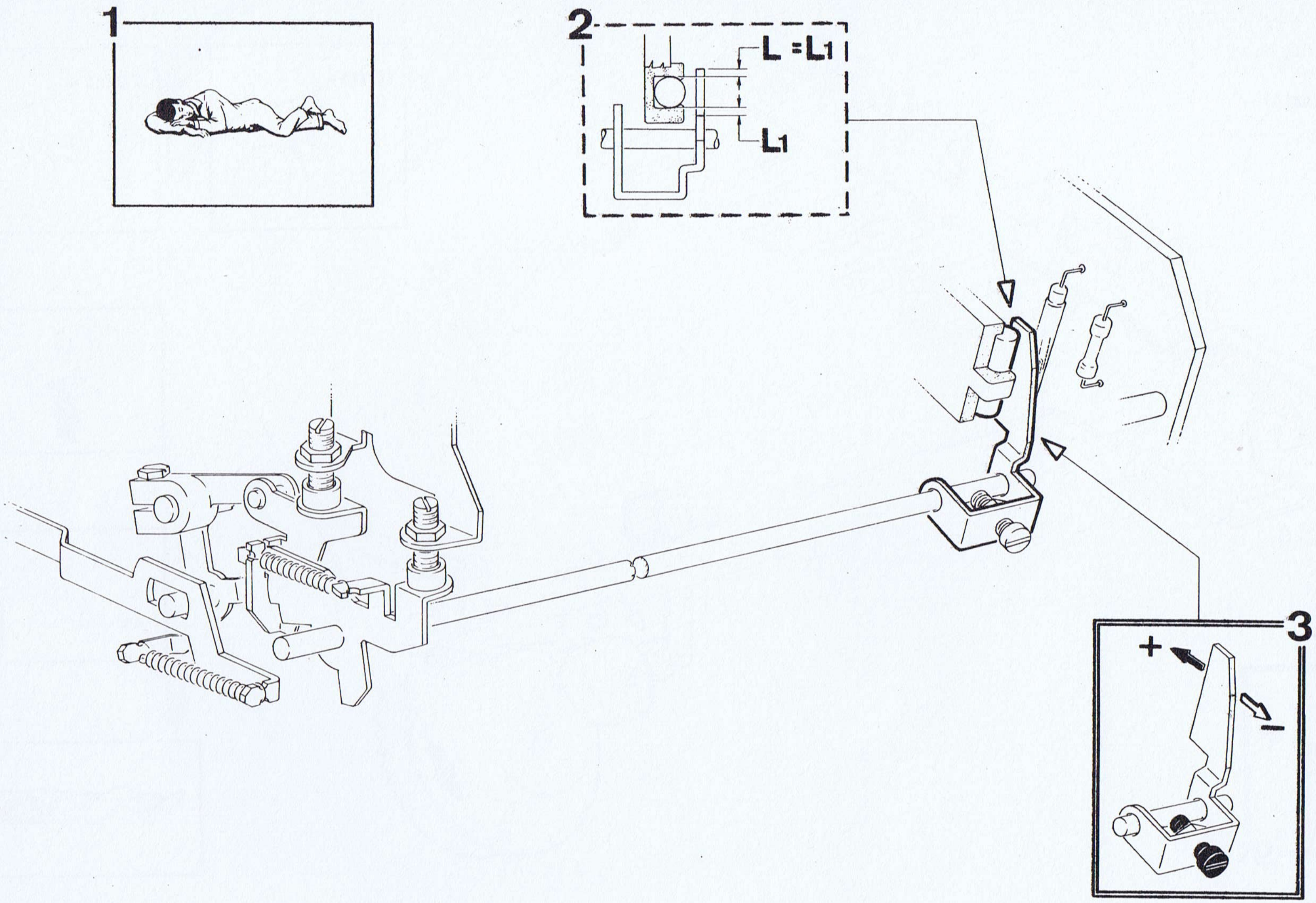
ADJUSTING THE CODING BAR LOCK MECHANISM (continued)



(Z-3, Manual release of the keyboard)

ADJUSTING THE ANGULAR POSITION OF THE AK REEDSWITCH SCREEN

During every entry cycle the condition illustrated on page B-26 (frame 3) must be achieved.



C-6 ← ①

②

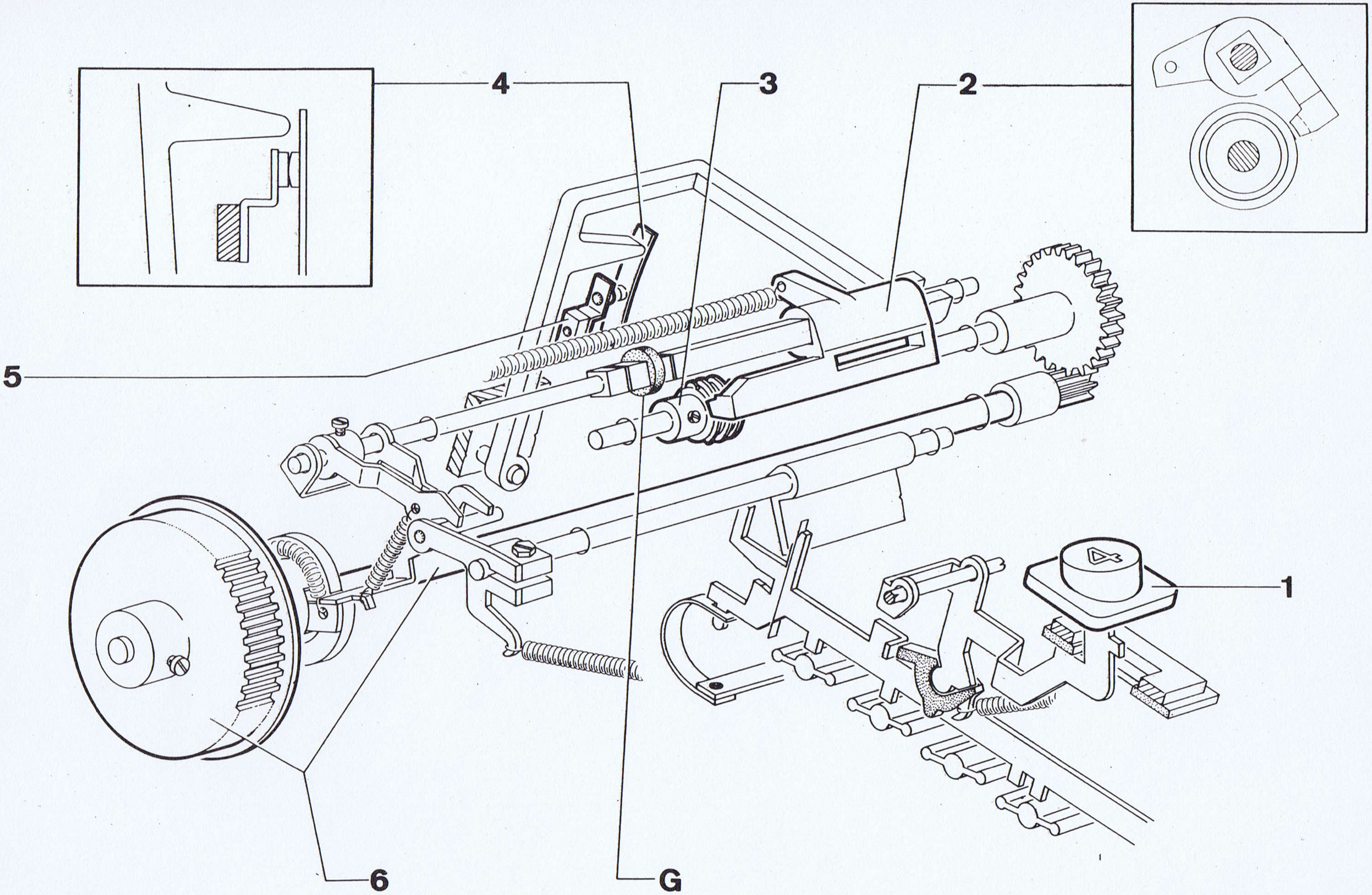
③

④

⑤

D-22 → ⑥

Section C
TIME SWITCH


G

Foreword

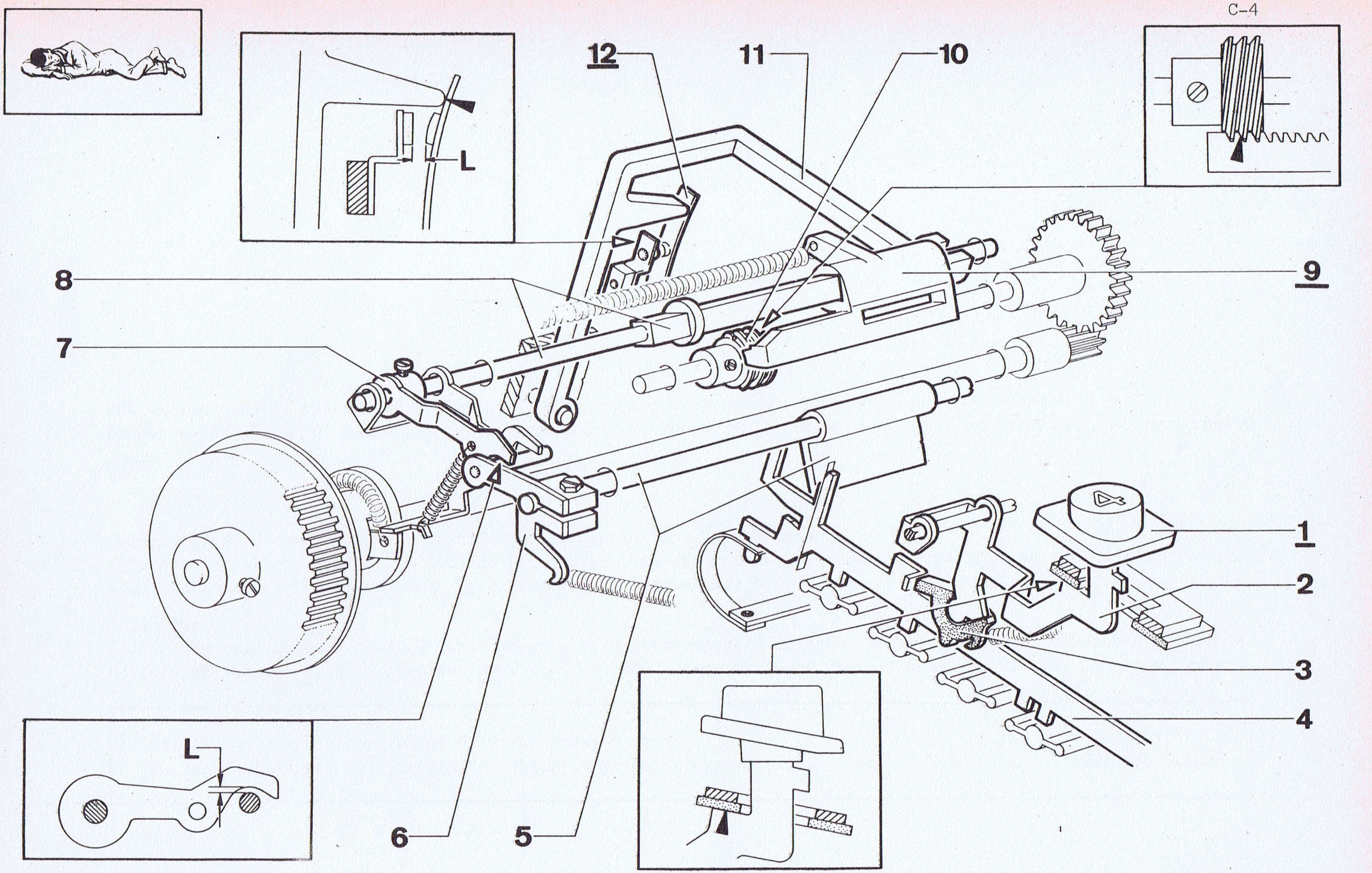
The time switch has the function of allowing the flow of electrical power to the motor (to make the servo shaft rotate) at the beginning of every entry cycle.

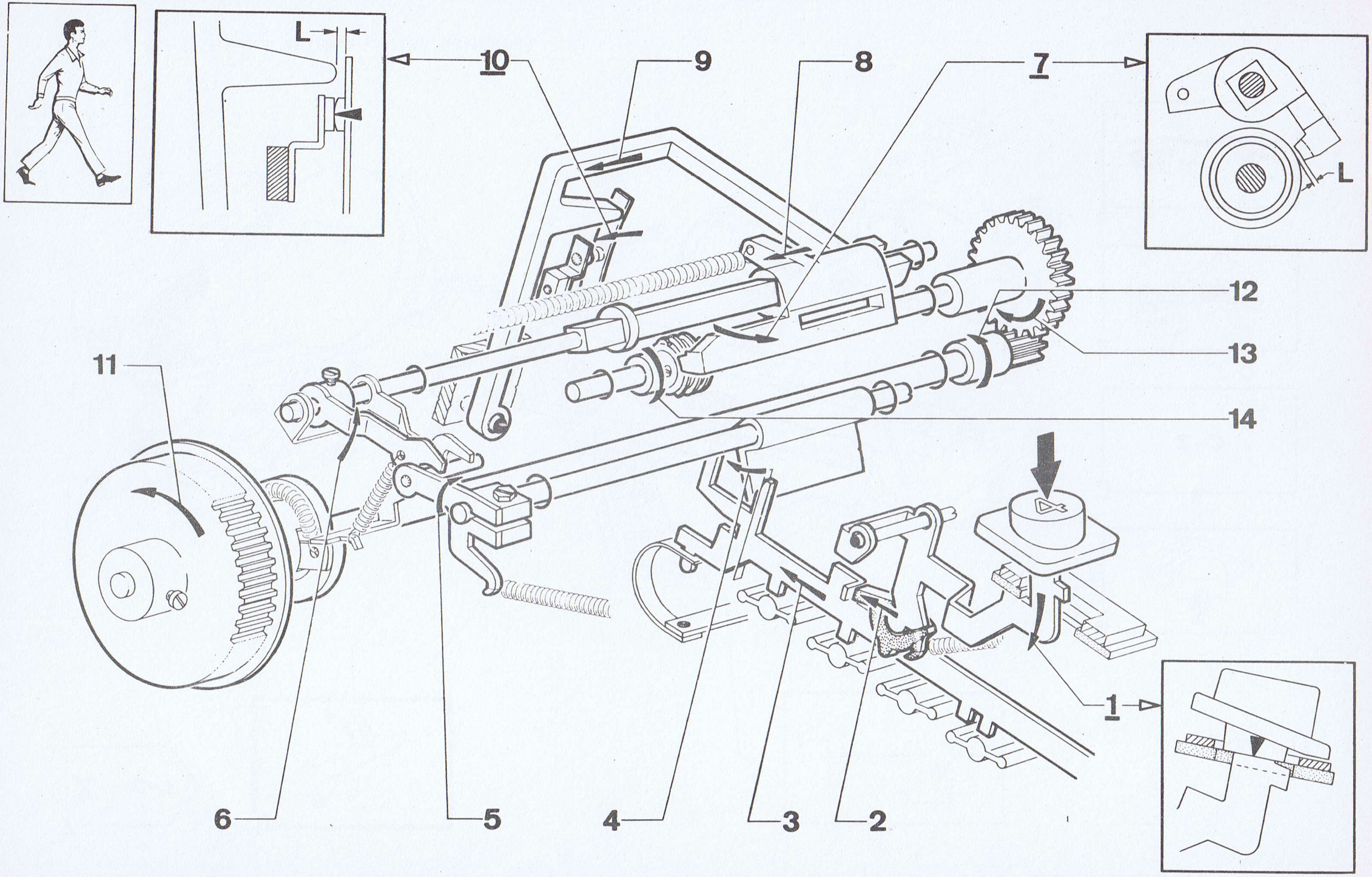
Depressing keyboard key 1, time switch rack 2 disengages pinion 3 and quickly moves in contact with rubber washer G. Consequently movable blade 4 makes contact with fixed blade 5 closing the motor circuit: servo shaft 6 starts rotating.

When the servo clutch disengages, time switch rack 2 reengages pinion 3 which makes the time switch rack move rightward slowly. After 3 to 6 seconds (if another key has not been depressed), the time switch rack reaches its home position reopening the motor circuit: the servo shaft stops rotating.

Note:

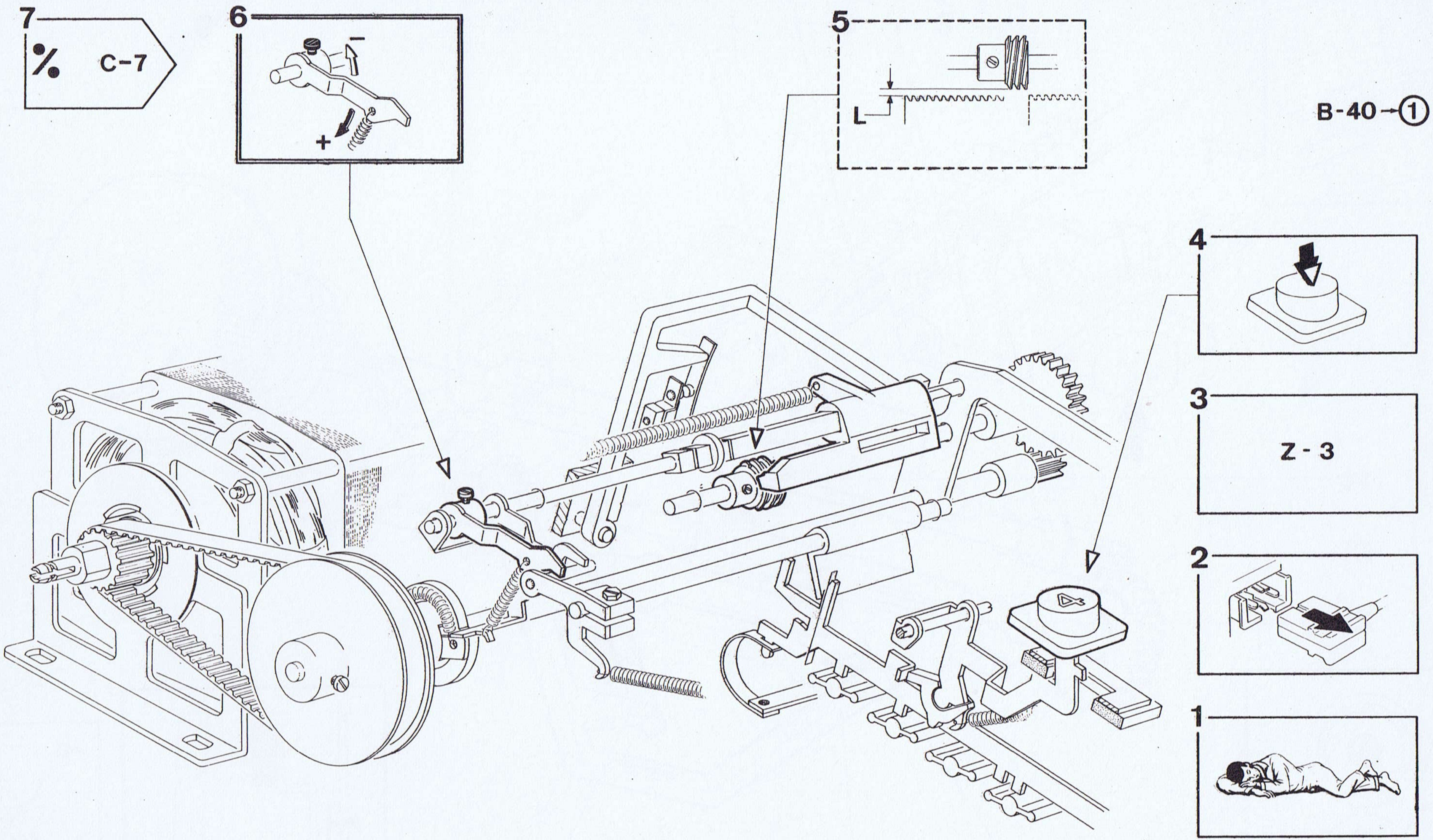
Rubber washer G can be assembled on the square bar in three different positions; in this way the time during which the switch remains closed can be chosen from a minimum of 3 seconds to a maximum of 6 seconds.


L
L


L
L

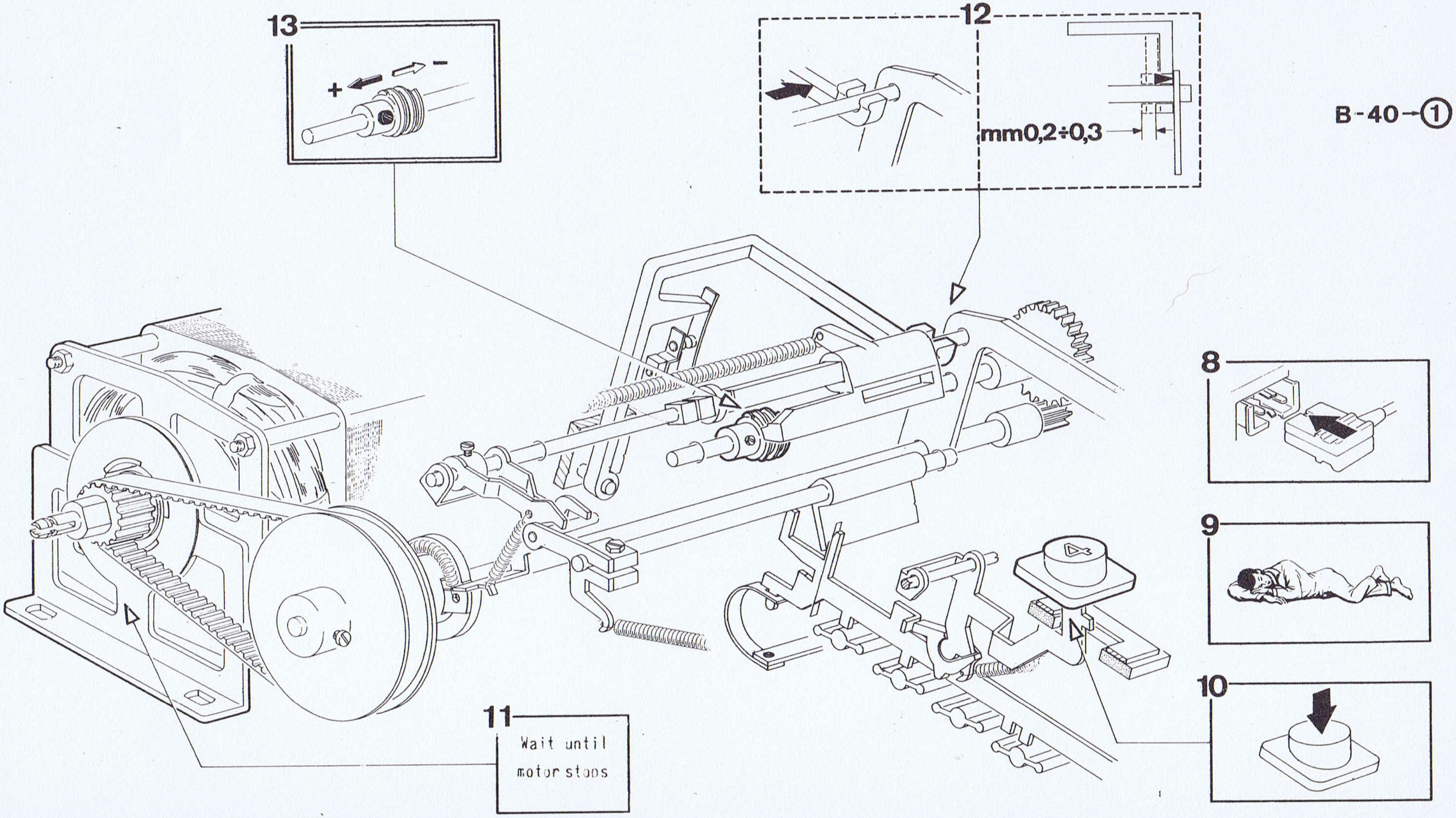
ADJUSTING THE TIME SWITCH

After depressing every keyboard key, the condition illustrated on page C-2 (frame 2) must be achieved.

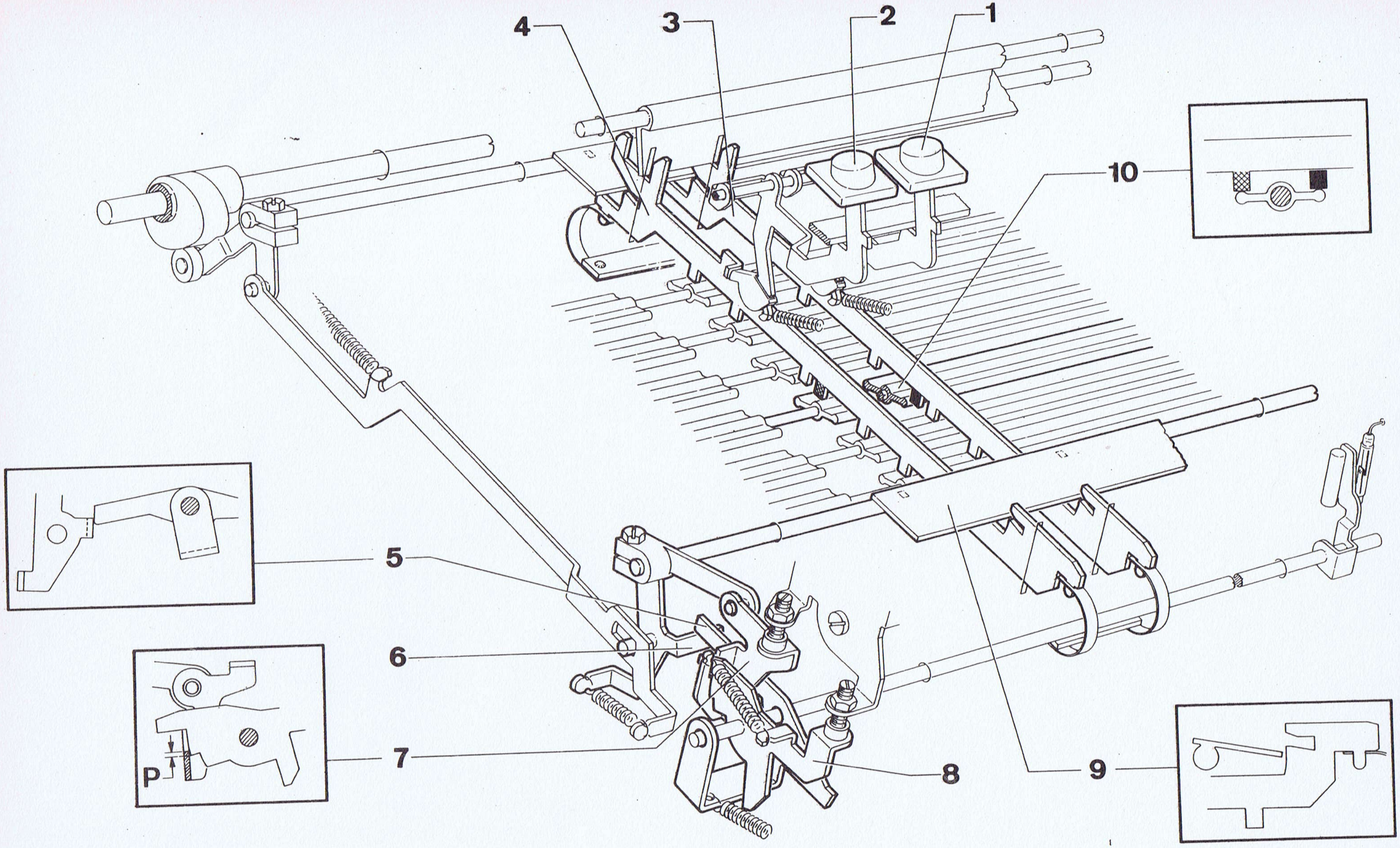


(Z-3, Manual release of the keyboard)

ADJUSTING THE TIME SWITCH (continuation)



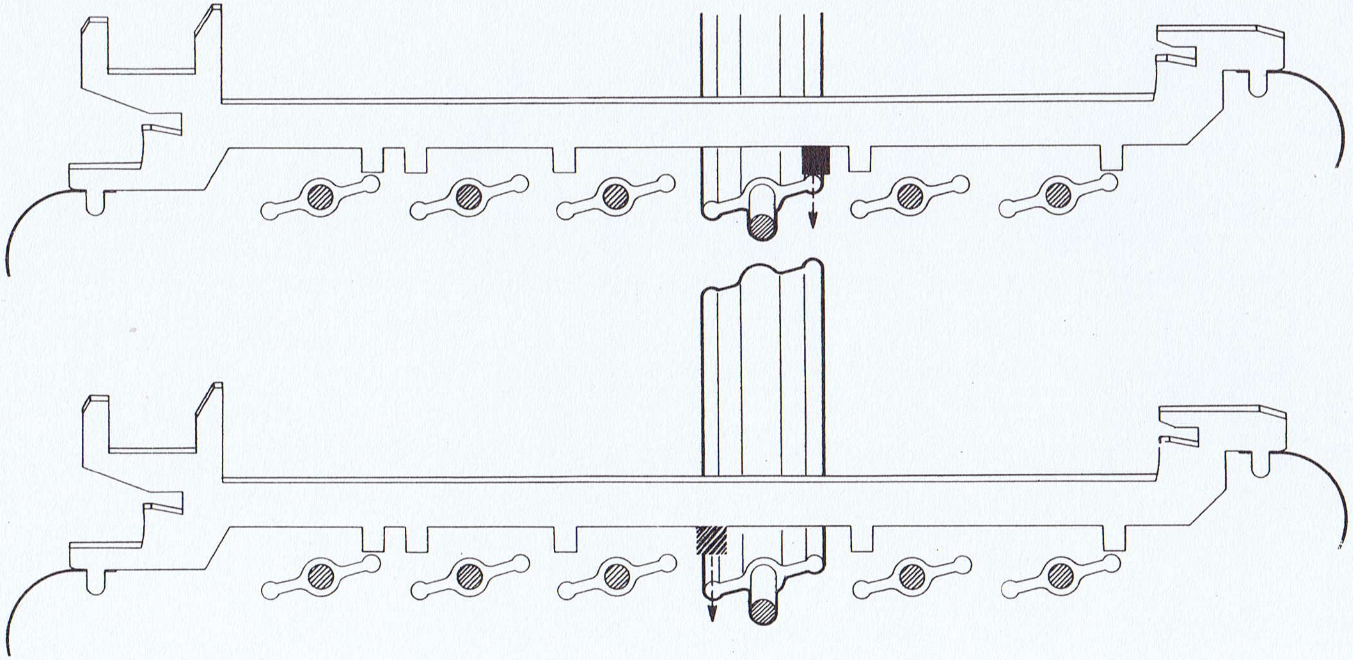
Section D
KEYBOARD LOCKS


P

Locking of the keyboard by a double key depression

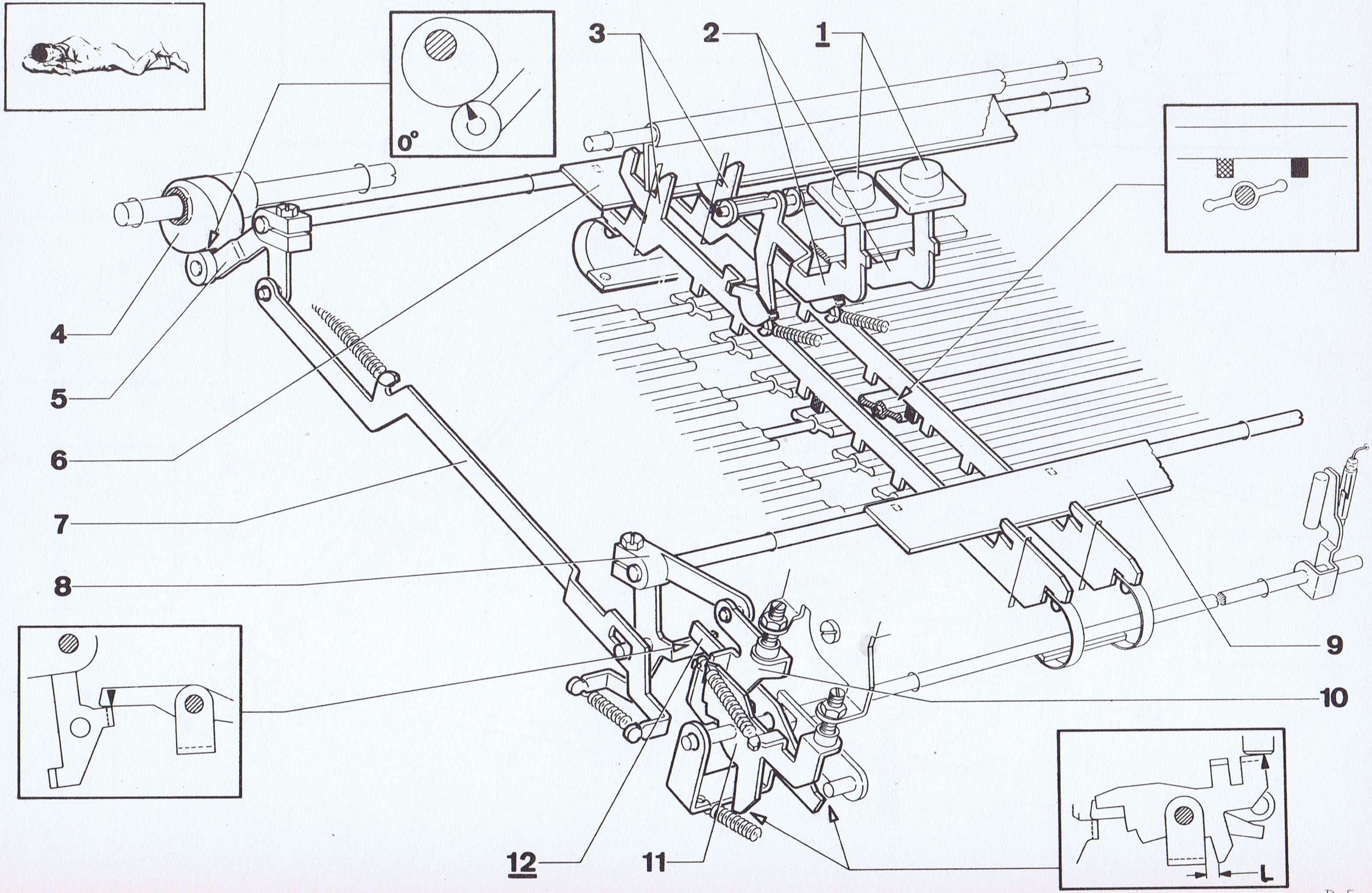
If two or more keys are simultaneously depressed, the machine does not perform any function and the keyboard is locked.

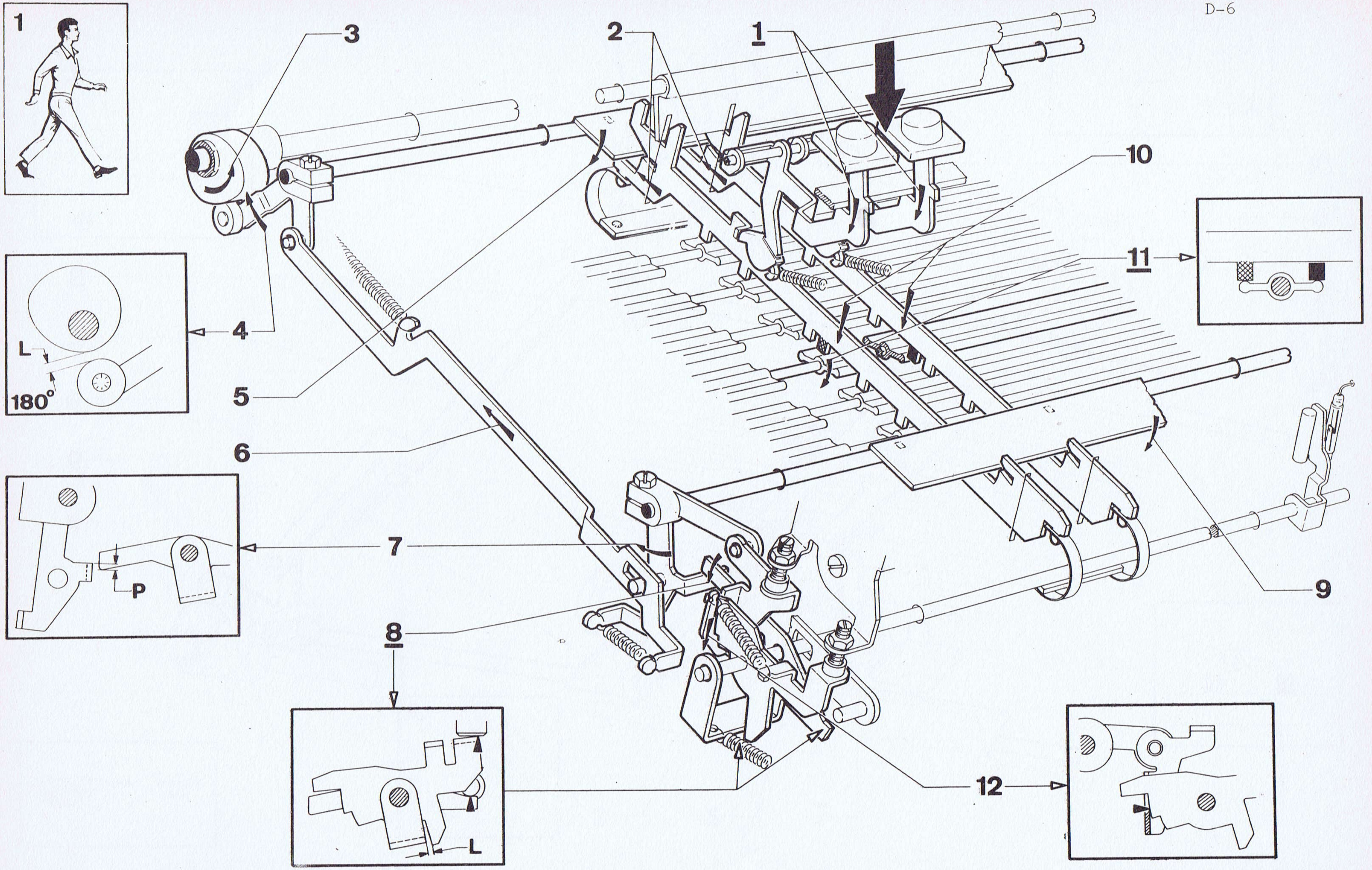
Simultaneously depressing keys 1 and 2, the respective "coding bar slide" 3 and 4 are regularly selected and the entry servo clutch engaged. By remembering how the coding of an instruction is realized (see page B-2), it can be seen that at least one of the six coding bars 10 is controlled in two opposite directions.

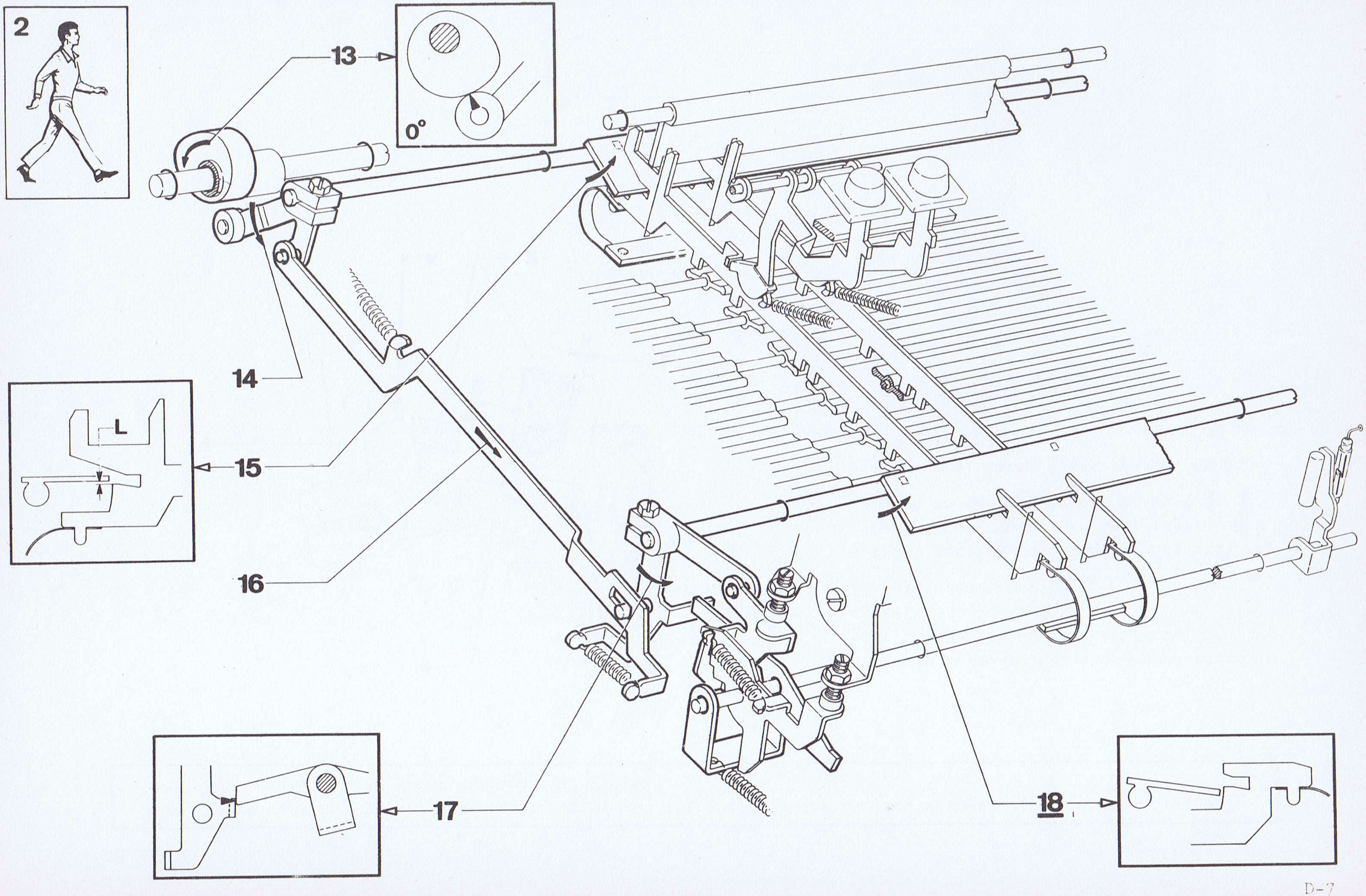


Consequently:

- "coding bars" 10 will not be positioned (= no coding)
- AK control plate 8 will not be engaged by AK control latch 7 (= no validation of the coding)
- arm 6 is locked by keyboard locking control bridge 5, therefore front setting bail 9 does not return to rest (= locking of the keyboard).

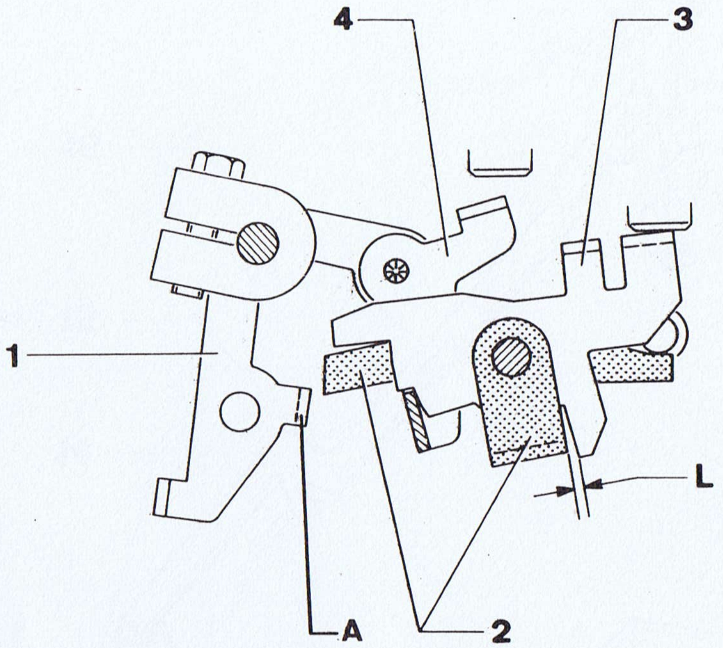

0°
L


L
180°
P
L


0°
L

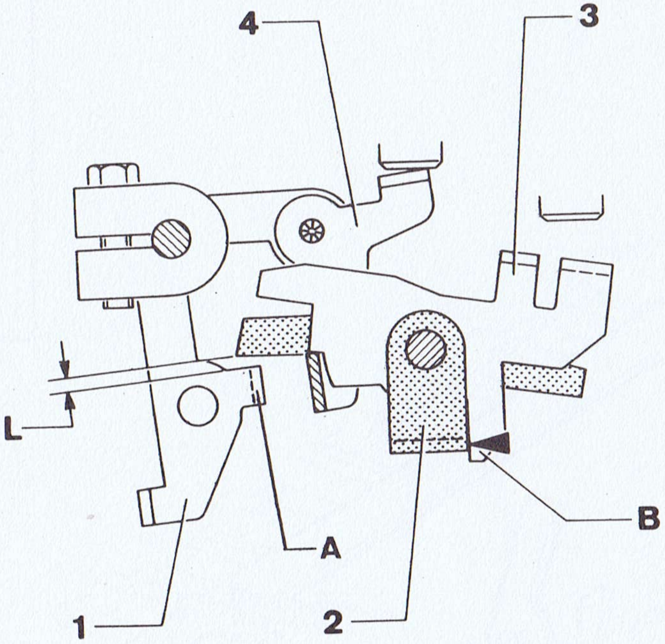
Notes

The locking of the keyboard must not occur during the normal entry cycles. Keyboard lock control bridge 2 must not interfere with front setting bail crank 1.



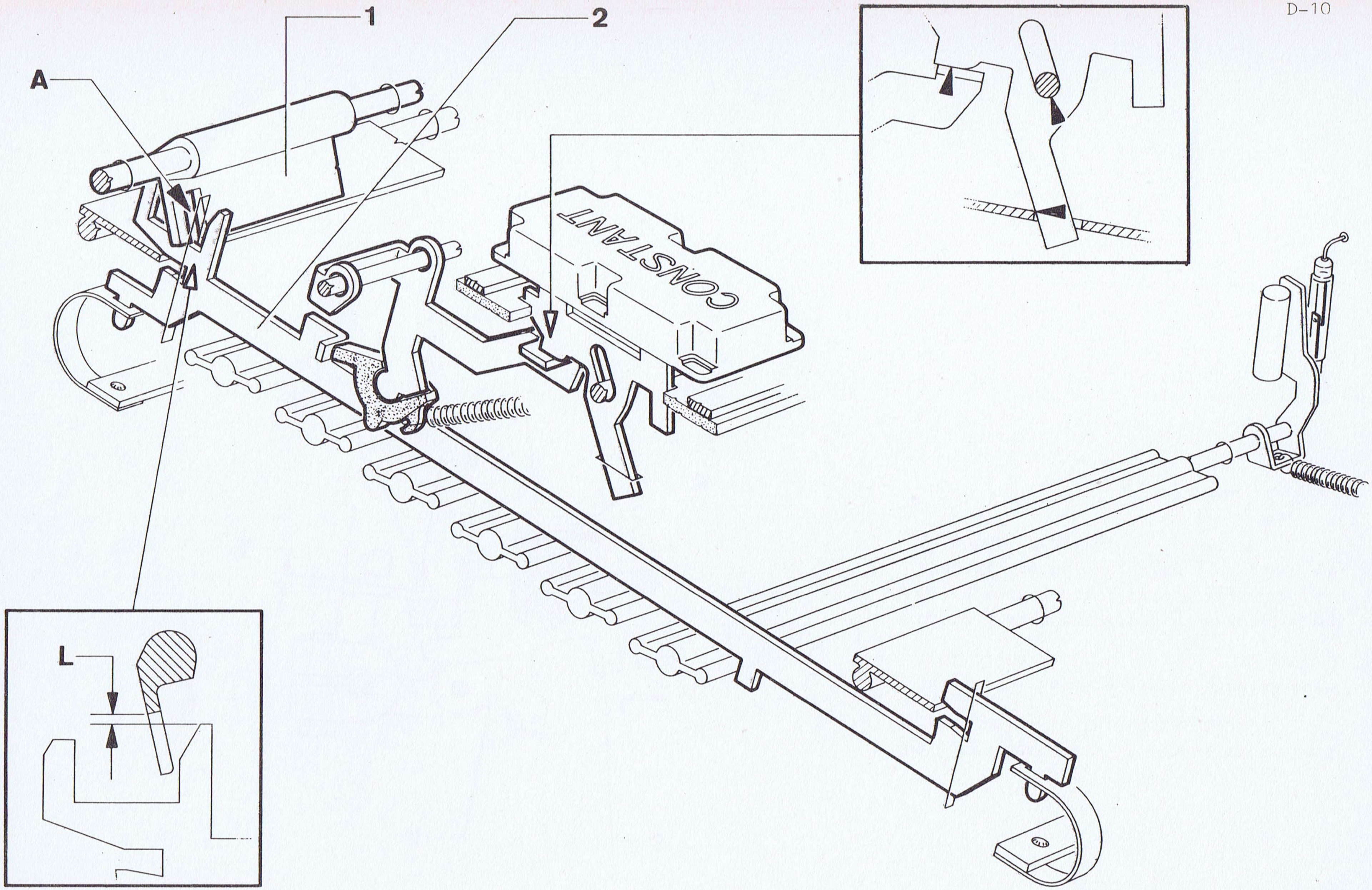
A single keyboard has been depressed. The entry mechanism is in the middle of the cycle.
In this condition:

- front setting bail crank 1 has left keyboard lock control bridge 2 that has moved on the trajectory of wing A.
- AK control latch 4 has engaged AK control plate 3.



The entry mechanism is almost at the end of the cycle. In this condition:

- AK control latch 4 has rotated AK control plate 3.
- plate 3 with extension B has rotated keyboard lock control bridge 2, causing its rear tip to be over wing A of front setting bail crank 1.

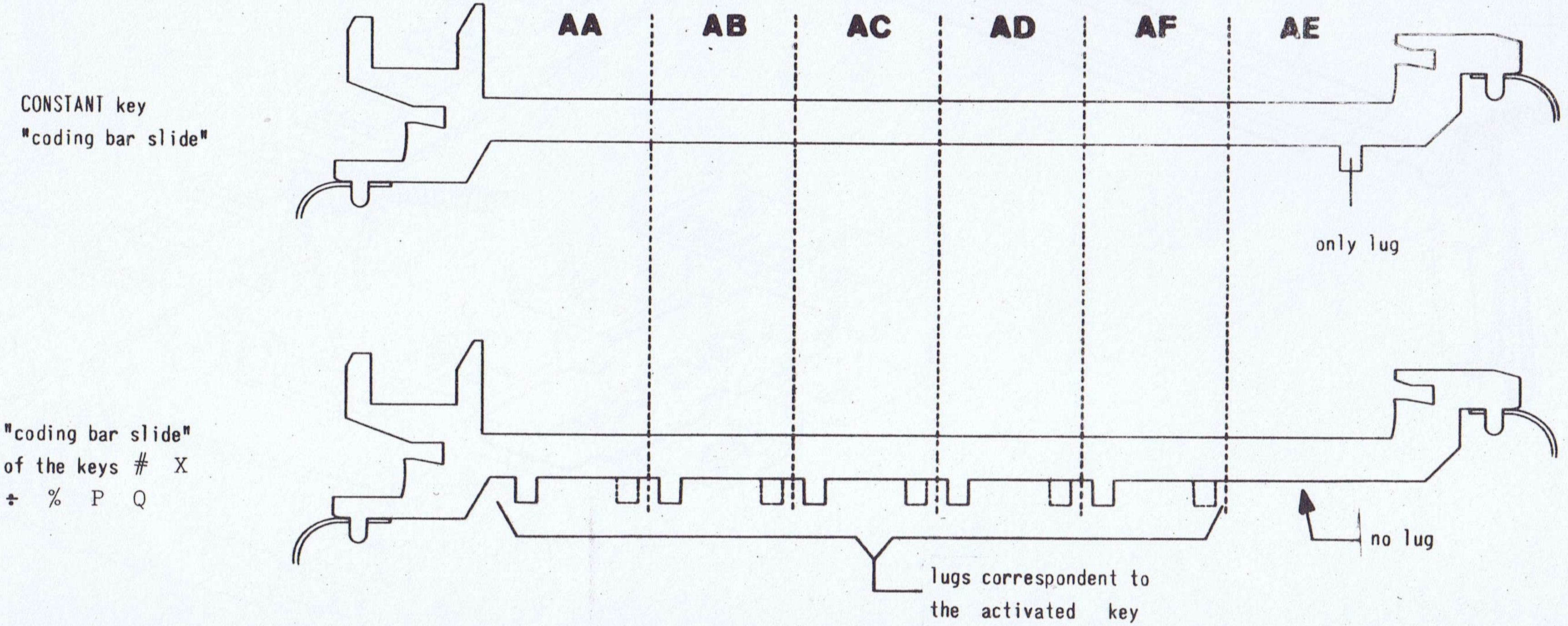

1
2
A
CONSTANT
L

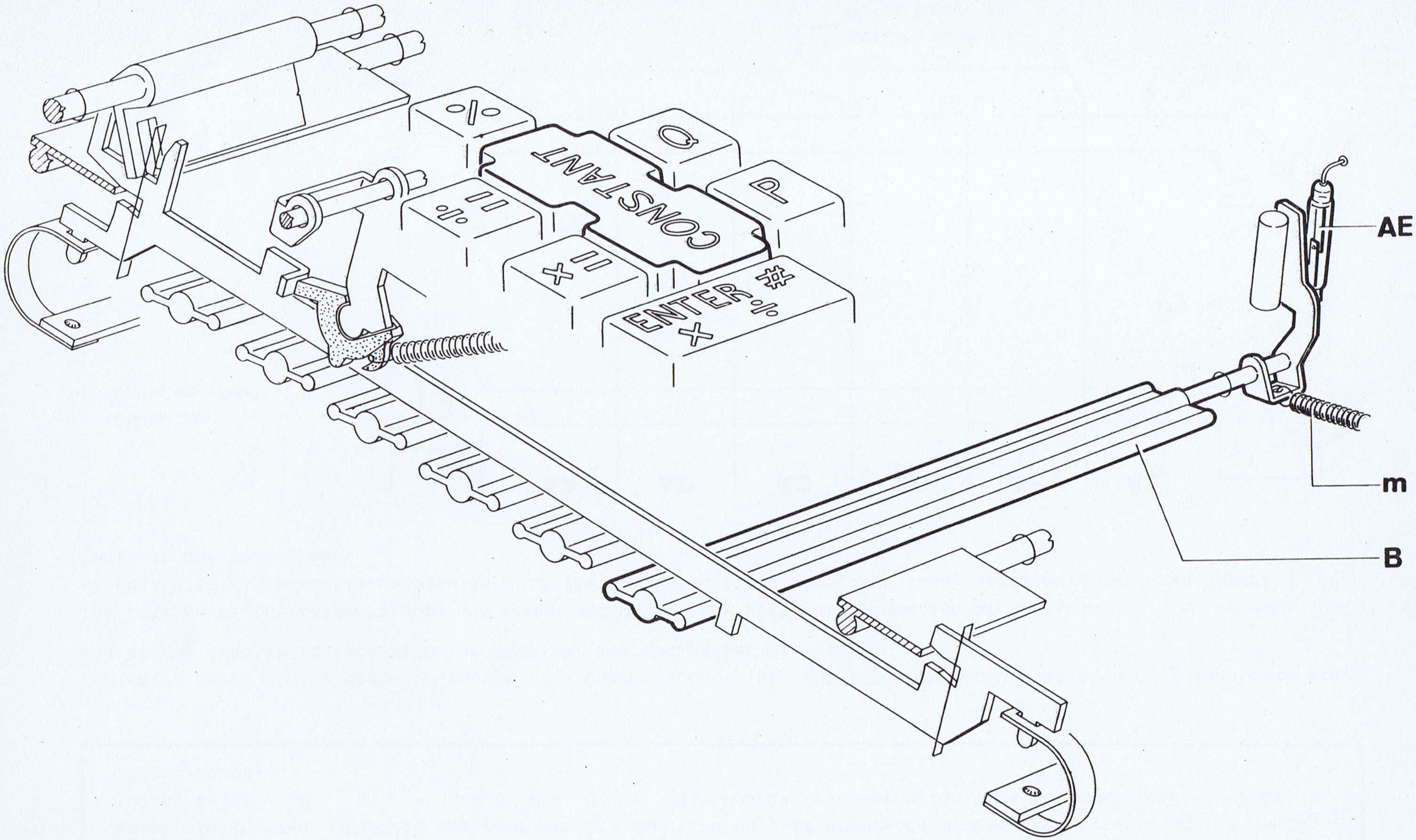
Particularity of the CONSTANT key

The CONSTANT key is not a motorized key. If depressed alone it does not cause the engagement of the entry servo clutch. The CONSTANT key performs its function only if depressed simultaneously with one of the following keys: # X ÷ % P Q . This double key depression does not cause the locking of the keyboard.

The entry servo clutch does not engage by a depression of the CONSTANT key because of opening A located on starting bail 1 exactly in line with the CONSTANT key coding bar slide.

The locking of the keyboard does not occur because of the particular location of the lugs of the coding bar slides. With all possible combinations of the above mentioned keys, the lugs cannot originate two opposite controls on one coding bar.




%
Q
CONSTANT
P
ENTER
AE
m
B

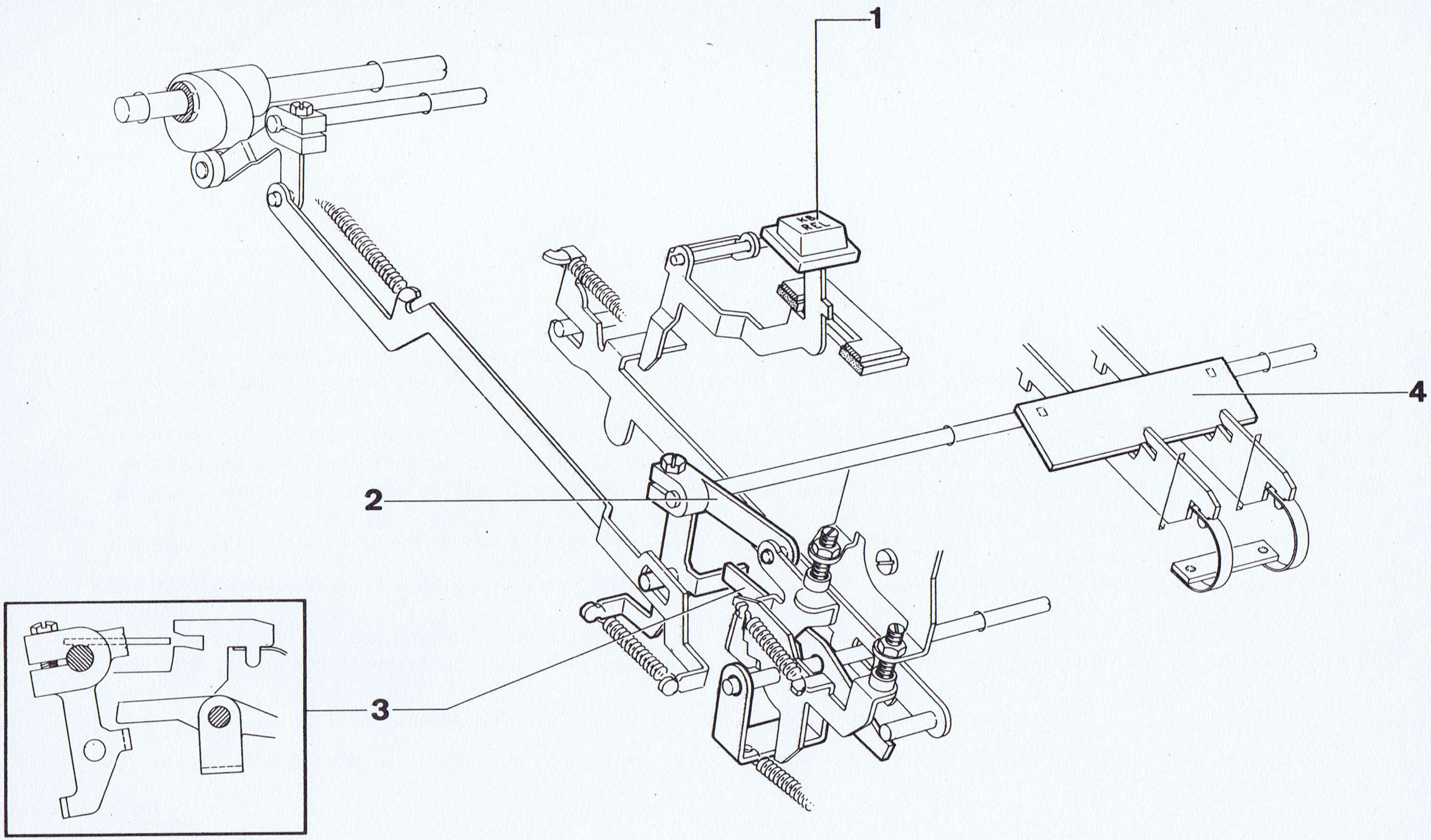
Note:

The "coding bar slides" of keys # X ÷ P Q are missing the lug related to the AE Reedswitch. Those coding bar slides, therefore, cannot modify the condition of the AE Reedswitch.

When one of the above mentioned keys is simultaneously depressed with the CONSTANT key, the AE Reedswitch is solely controlled by the coding bar slide related to the CONSTANT key.

The difference between a single operation (# X ÷ P Q) and the same operation combined with the CONSTANT key is to be found in the presence (or not) of the AE signal (AE = 1).

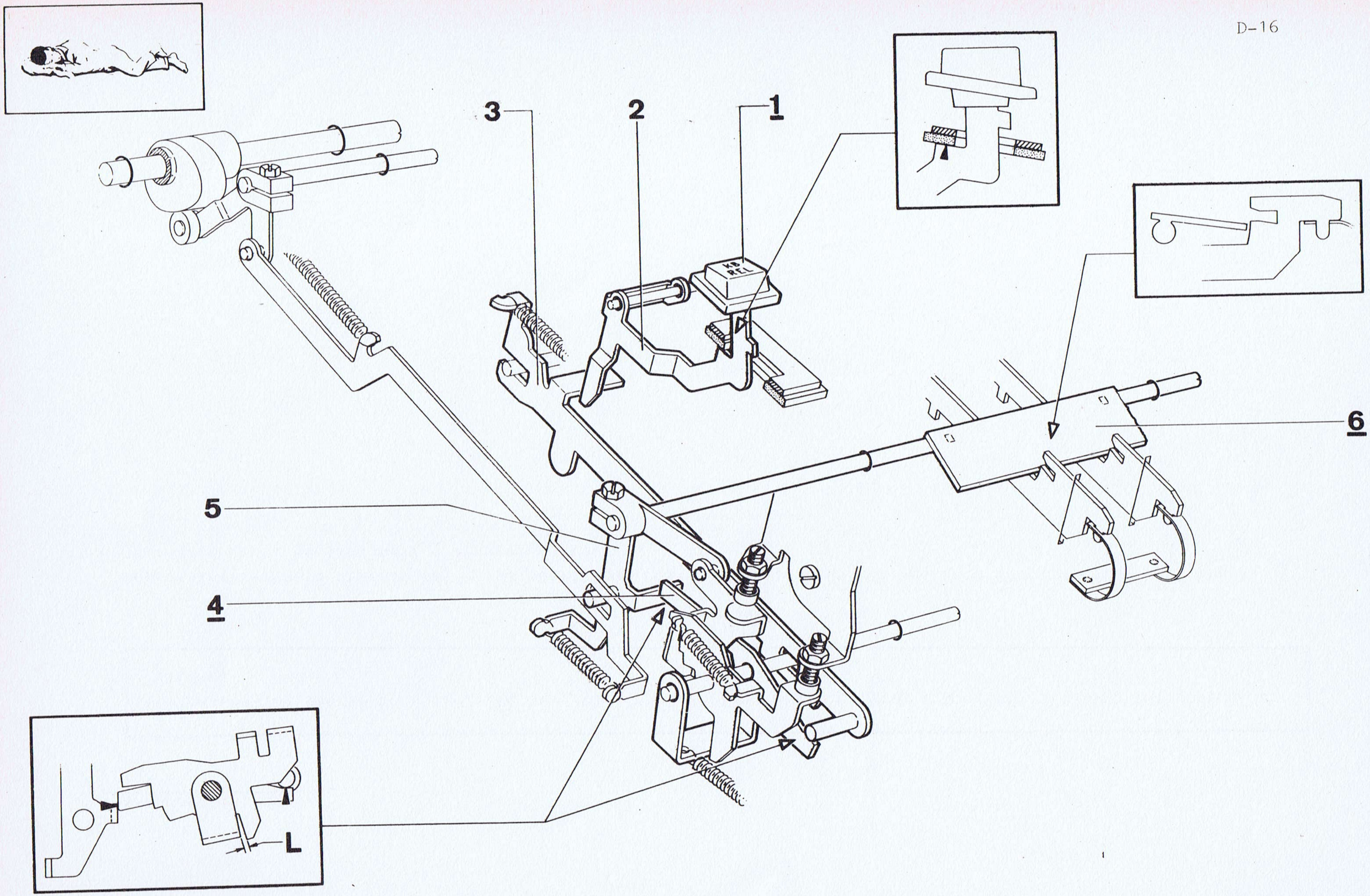
If, after having performed an operation combined with the CONSTANT key the same operation is performed without the CONSTANT key, the presence of the AE signal (which cannot be removed by the coding bar slide related to the depressed key) could erroneously make a single operation interpreted as an operation combined with the CONSTANT key.
To overcome this inconvenience, spring m at the beginning of every entry cycle restores to position "0" the coding bar related to the AE Reedswitch.

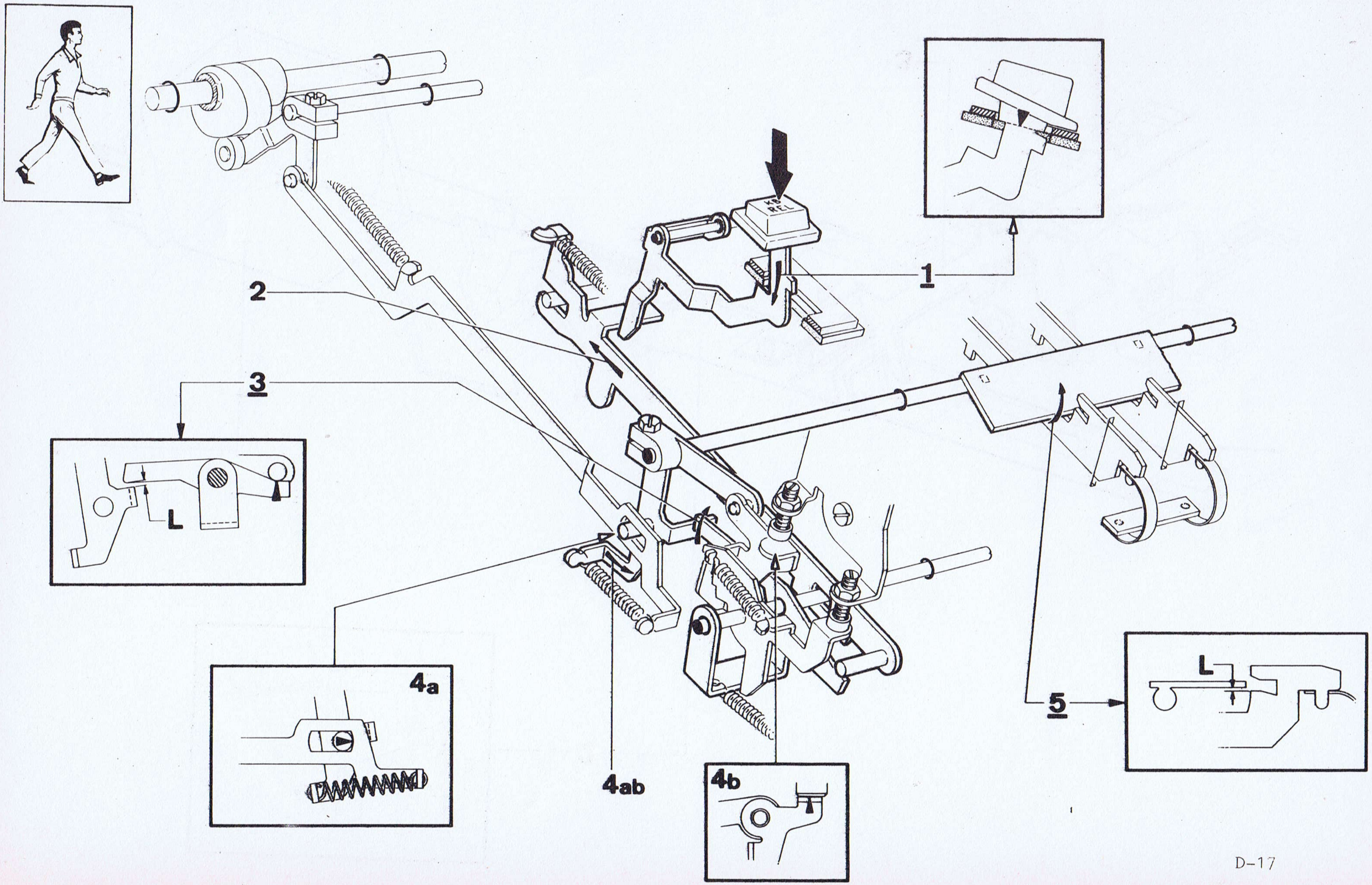

KB REL

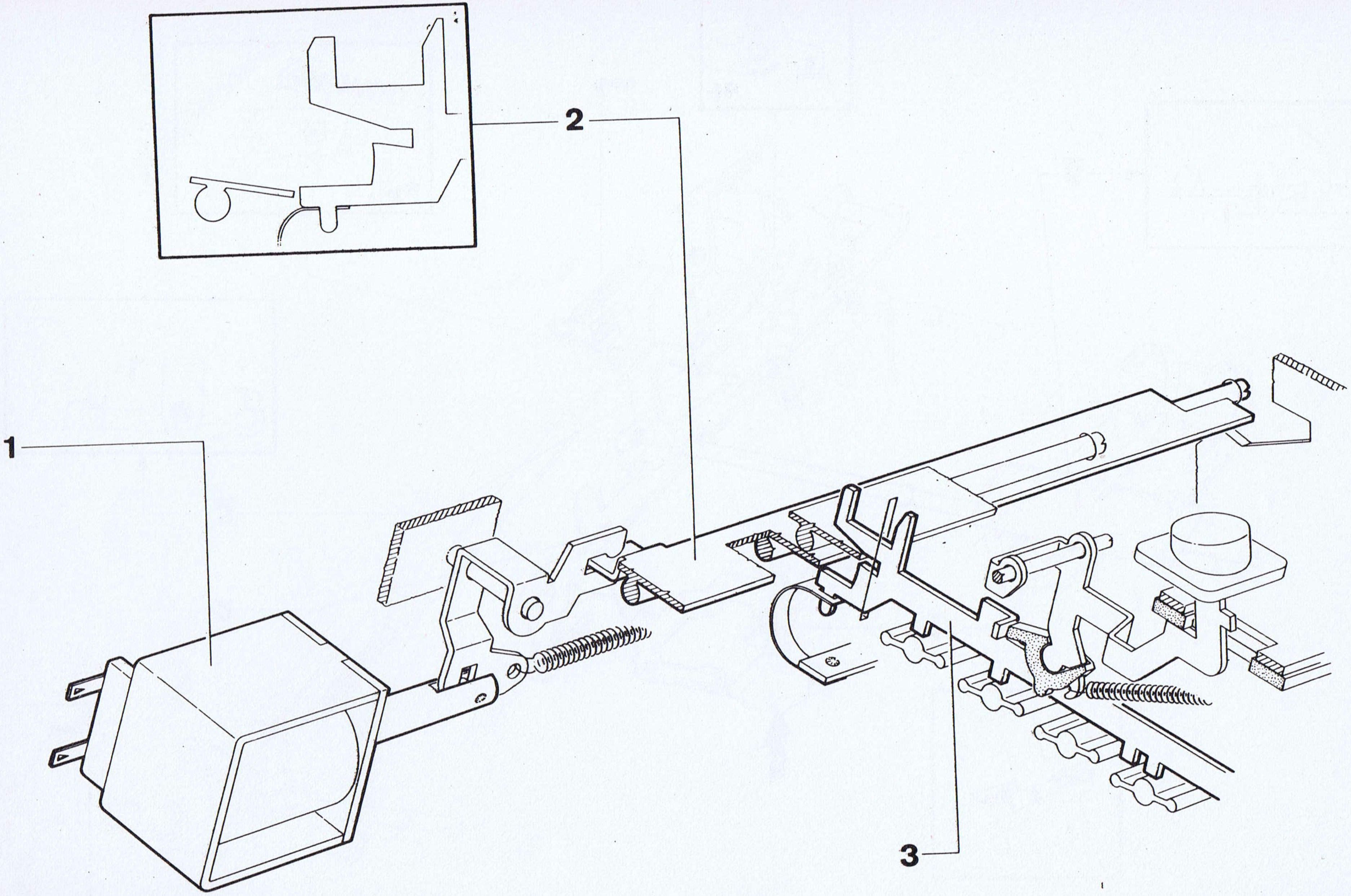
Keyboard release

By depressing the keyboard release key, the front setting bail is brought to rest releasing the coding bar slides.

Depressing keyboard release key 1, keyboard lock control bridge 3 is removed from front setting bail crank 2, therefore front setting bail 4 returns to rest.


KB REL
L


KB REL
1
2
3
L
4a
4ab
4b
5
L

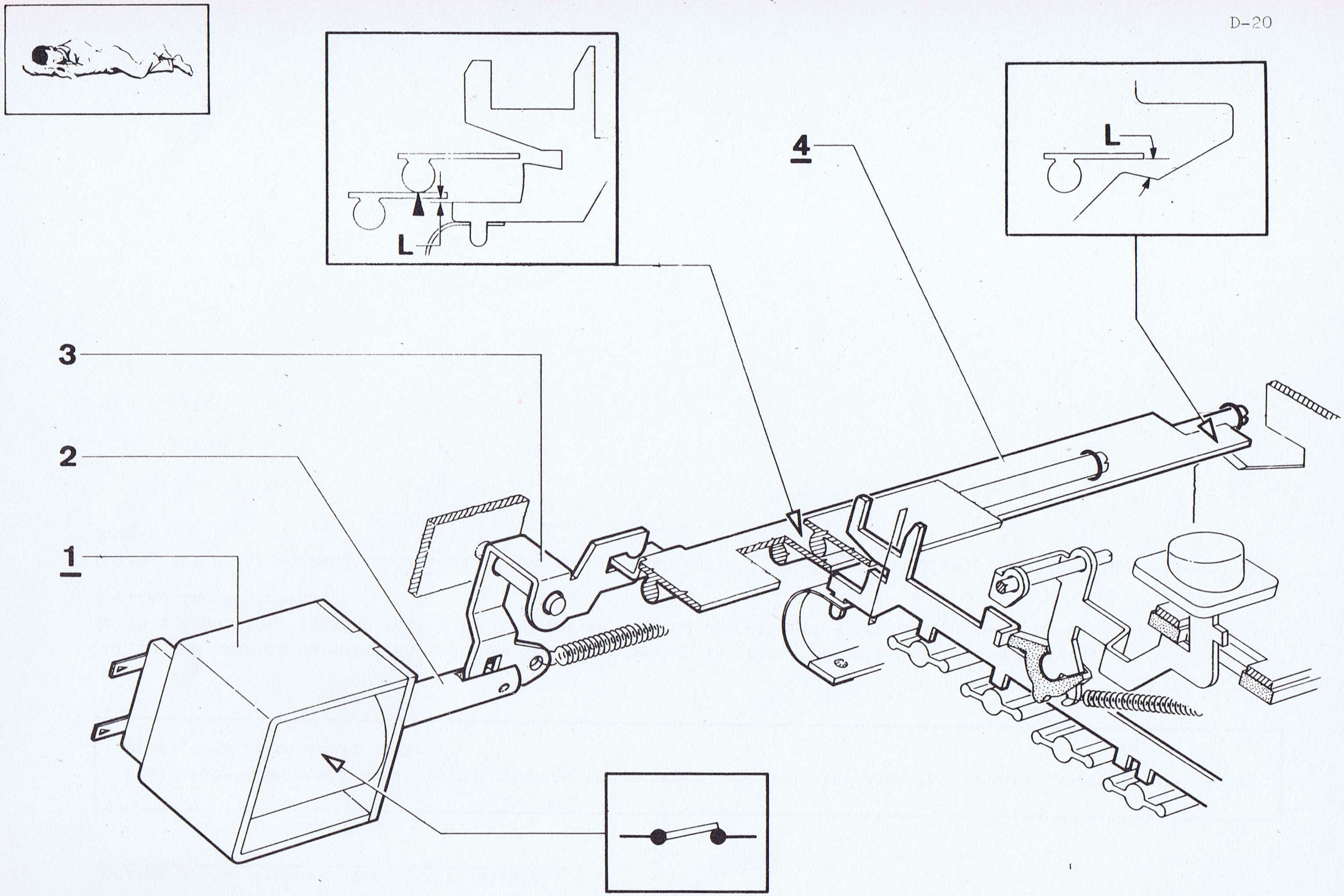


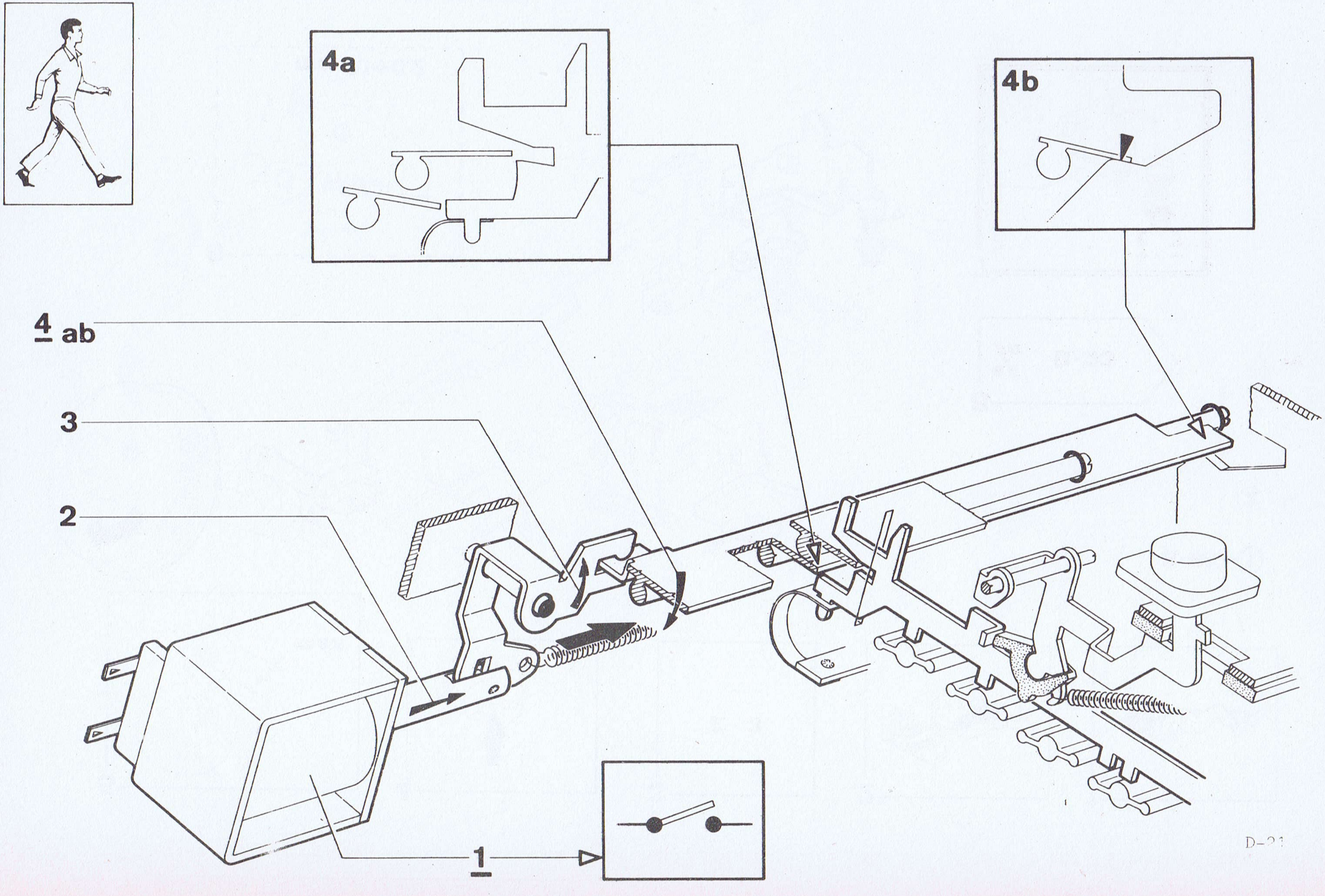
Locking of the keyboard during the calculation

While the "electronic unit" is calculating the entered data and also when the machine is OFF (power switch open), the keyboard is locked.

During the machine calculation and when the power switch is open, the solenoid is deenergized.
In this condition, locking bail 2 is in front of "coding bar slides" 3 preventing their movement and therefore locking the keyboard.

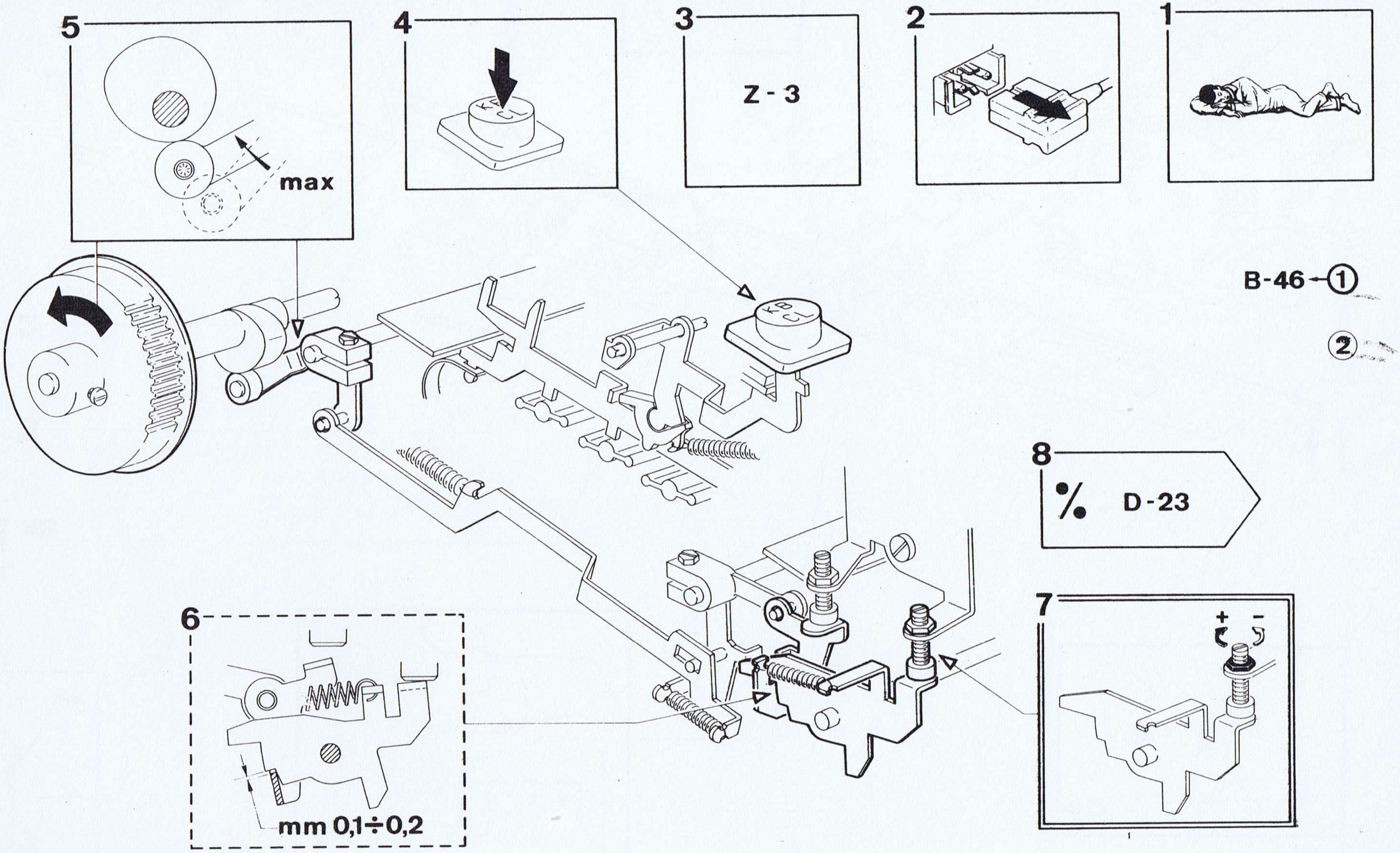
During the other working conditions of the machine, solenoid 1 is always energized, therefore the keyboard is free.


L
L


4a
4b
4 ab
3
2
1

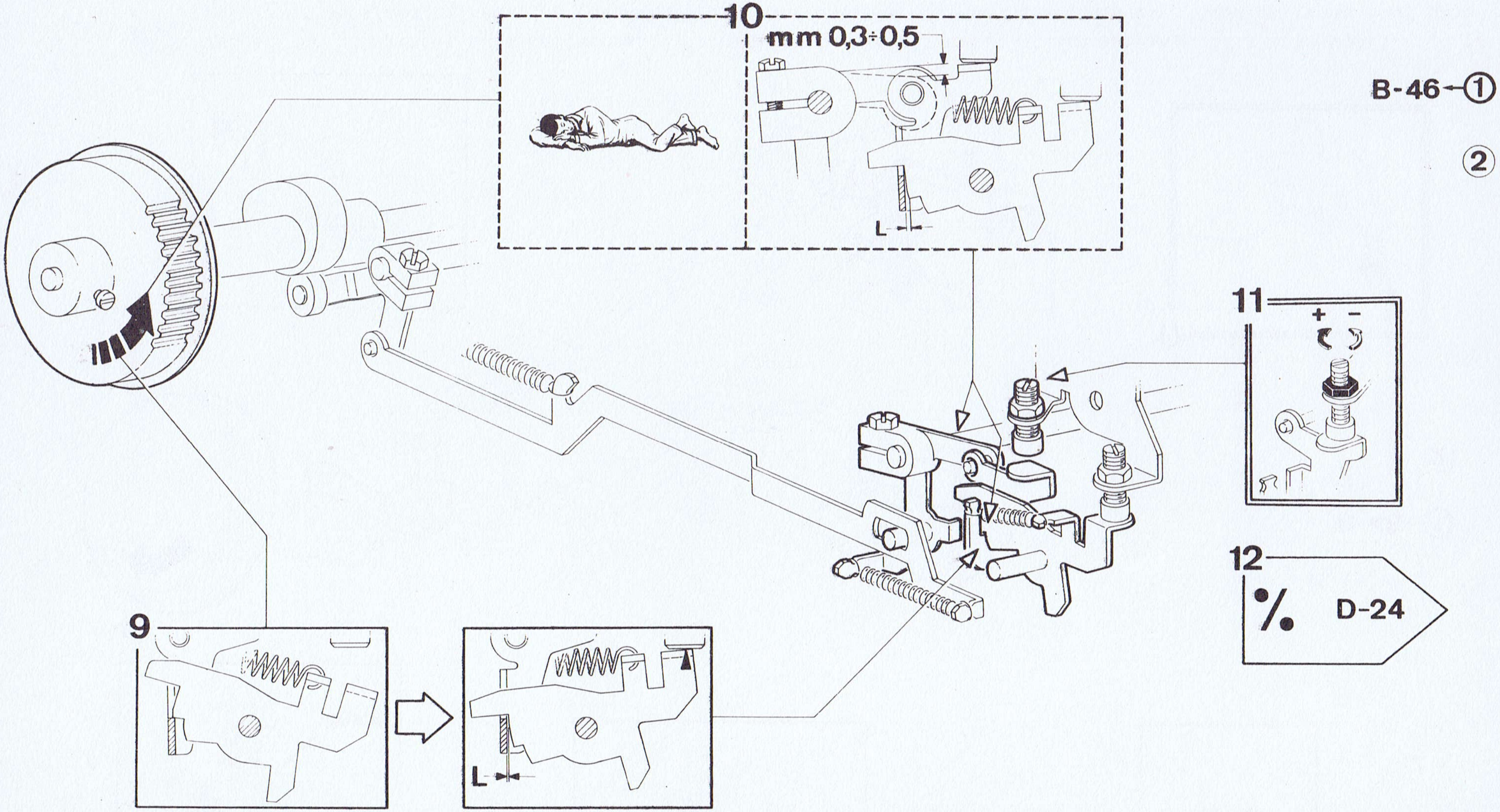
ADJUSTING THE DOUBLE ENTRY KEYBOARD LOCK

After depressing each keyboard key, the conditions illustrated on page D-2 (frames 5 and 7) must be achieved.



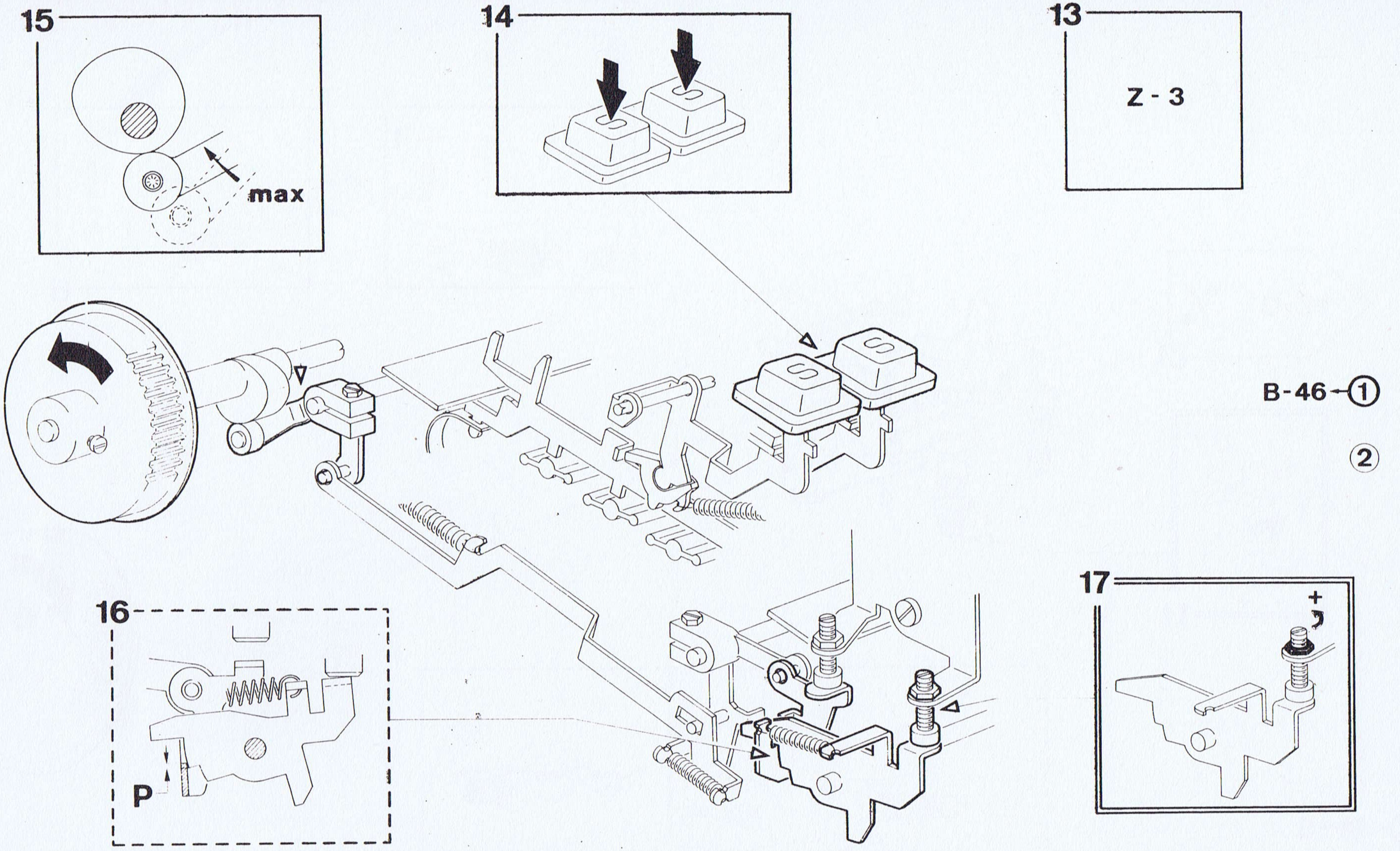
(Z-3, Manual release of the keyboard)

ADJUSTING THE DOUBLE ENTRY KEYBOARD LOCK (continuation)



NOTE: Repeat the adjustment with the P key.

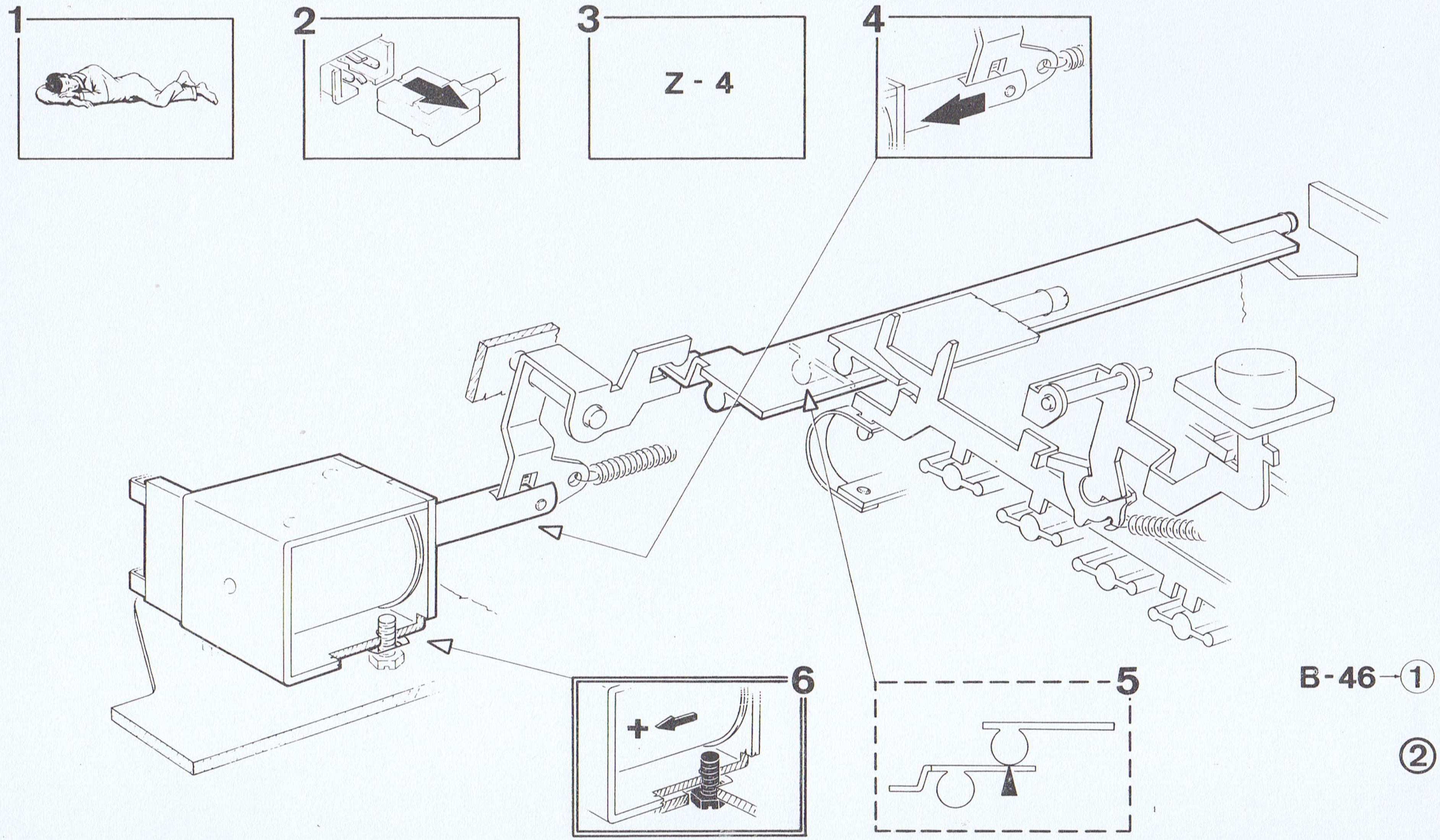
ADJUSTING THE DOUBLE ENTRY KEYBOARD LOCK (continuation)



NOTE: Repeat the adjustment by simultaneously depressing two keys located at the extremes of the keyboard.
Hold P is obtained by reducing (eventually to the possible minimum) the clearance shown on frame 6 of page D-22)
(Z-3, Manual release of the keyboard)

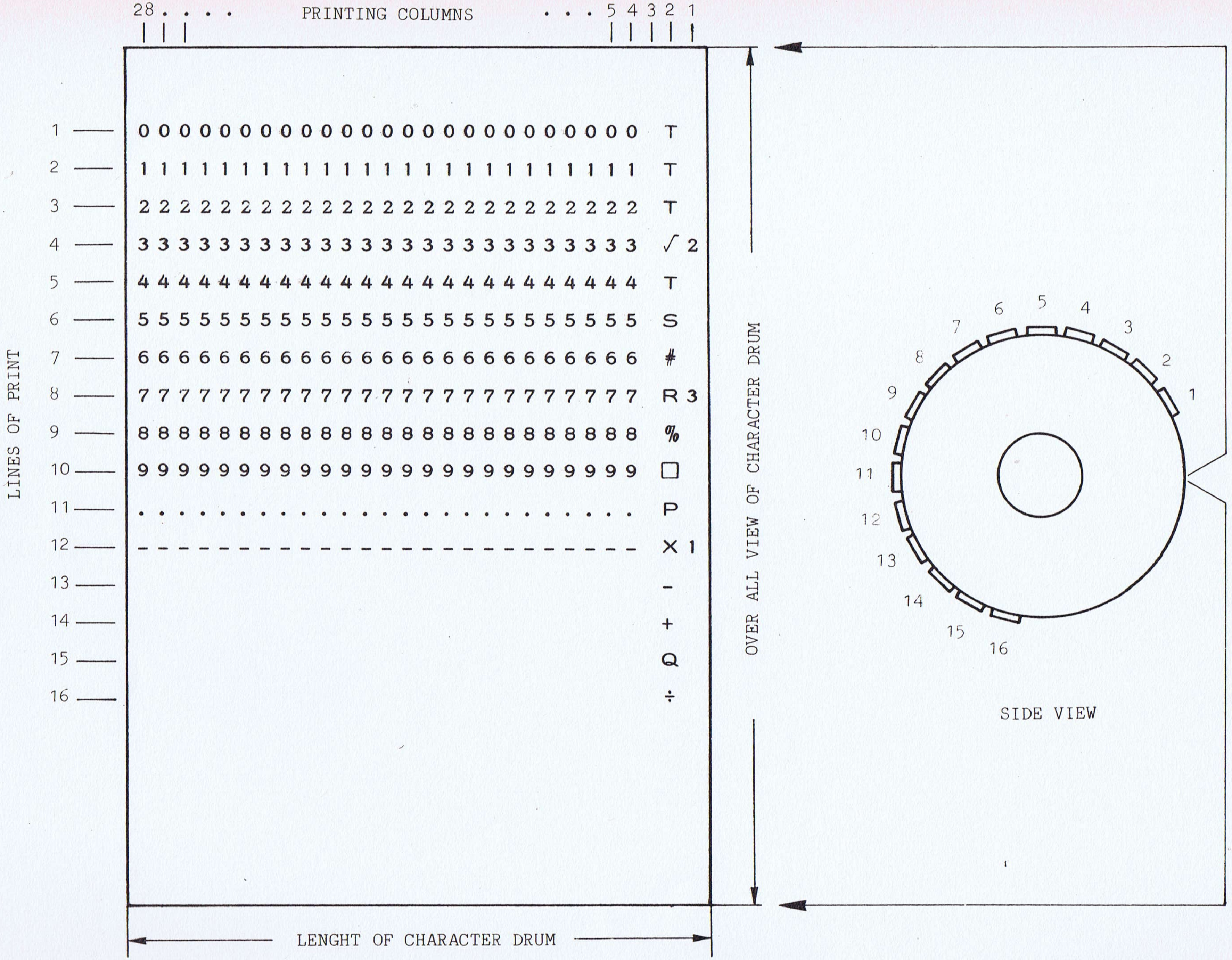
ADJUSTING THE KEYBOARD LOCK DURING THE OPERATION

With the power switch on, but with the machine not in operation, the keyboard must be unlocked. If otherwise, the condition illustrated on page D-18 (frame 2) must be achieved.



NOTE: The support condition must be checked on the whole length of the Bail or at least on its extremes. (Z-4, Removal of the keyboard).

Section E
PRINTING UNIT


28 . . . . PRINTING COLUMNS . . . 5 4 3 2 1
LINES OF PRINT
1 0000000000000000000000000 T
2 1111111111111111111111111 T
3 2222222222222222222222222 T
4 3333333333333333333333333 √ 2
5 4444444444444444444444444 T
6 5555555555555555555555555 S
7 6666666666666666666666666 #
8 7777777777777777777777777 R 3
9 8888888888888888888888888 %
10 9999999999999999999999999 □
11 . . . . P
12 - X 1
13 -
14 +
15 Q
16 ÷
OVER ALL VIEW OF CHARACTER DRUM
LENGHT OF CHARACTER DRUM
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
SIDE VIEW

Introduction

On the LOGOS 270 each character is printed on the tape, one at a time, from right to left.
The principle by which printing is performed is as follows:
The paper is held pressed against the characters that are raised on a metal cylinder "character drum" (that also acts as a platen) as is illustrated on the front page. (Note that the surface of the drum has been developed on a flat level).

The characters are arranged on 16 lines that occupy about three quarter of the drum surface.

The printing capacity is 28 columns:

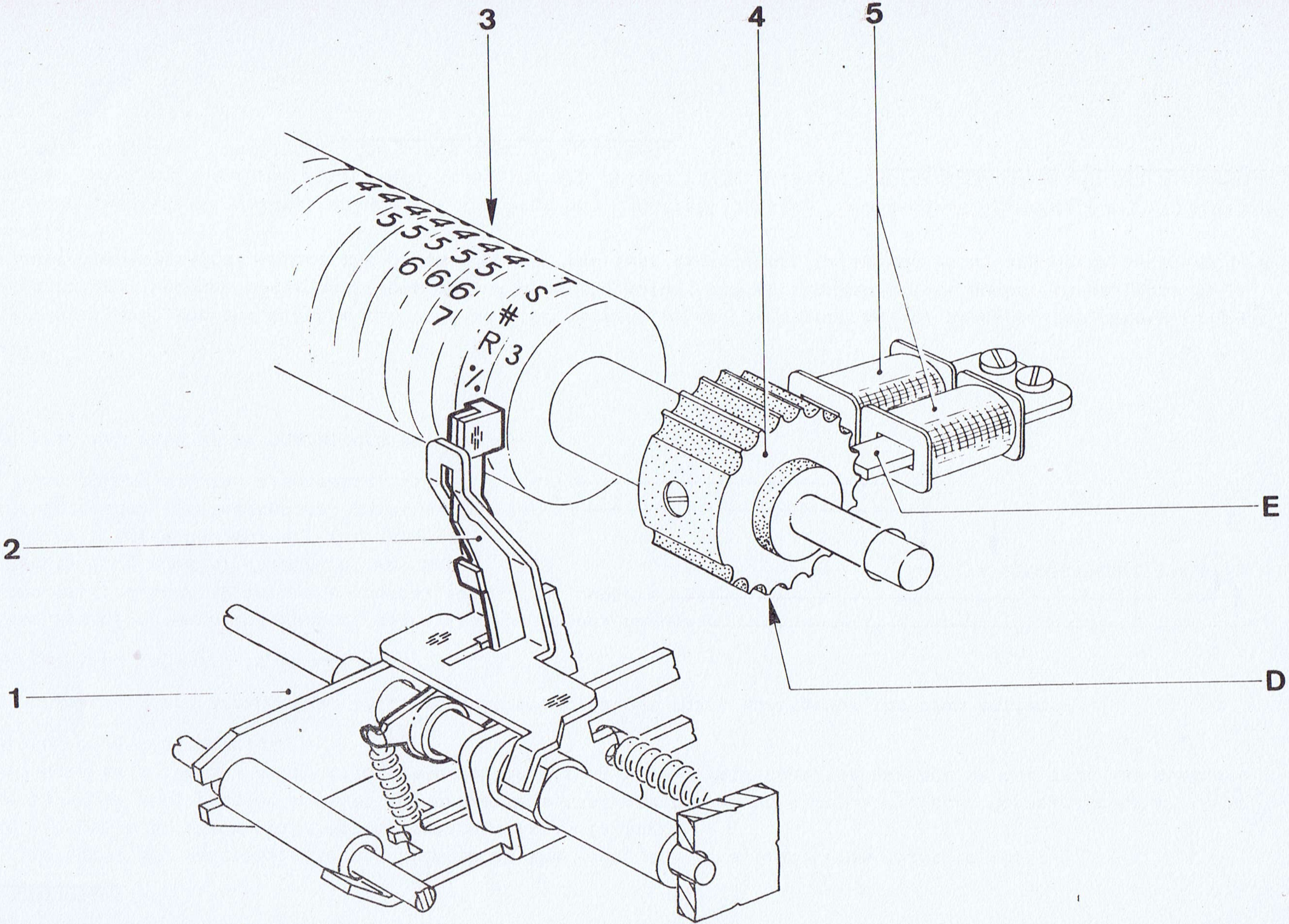
- two symbol columns for special signs that accompany numbers
- one empty column to separate special signs from numbers
- twenty five numeral columns of which:
  - Twenty three columns are for numbers
  - One column for the decimal point
  - One column for the algebraical sign - (minus)

-12374.23590043688123742 9 S3

The printing rate is 30 characters per second.

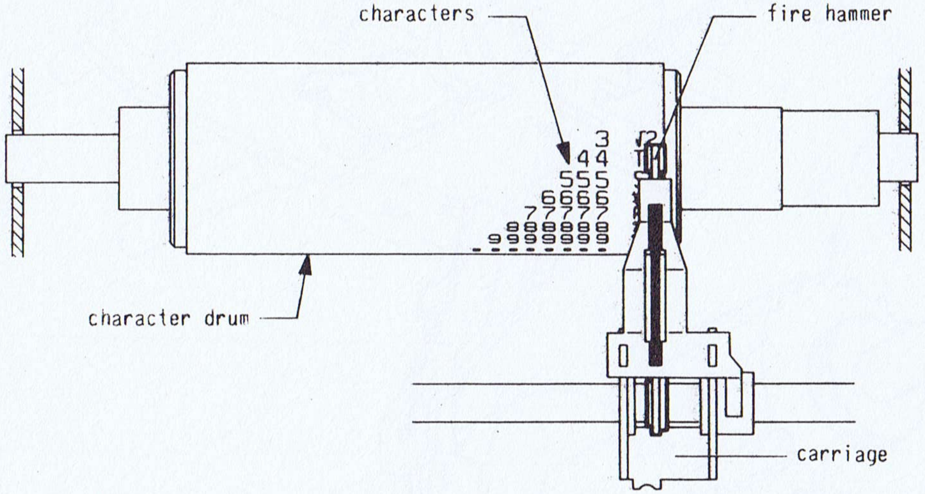
Note:

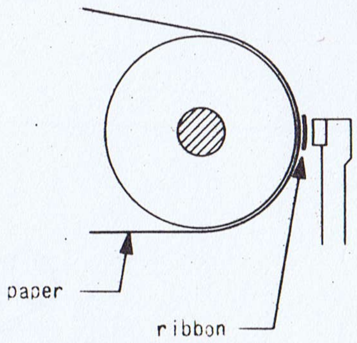
The two columns for the algebraical sign and the decimal point can appear in any place of the twenty five numeral columns because their positions depend upon the nature and the length of the number to be printed.
Without the algebraical sign or the decimal point, the last two columns (27th and 28th) are never occupied by a number.
Although twenty five numeral columns of the drum are identically made, including all numbers (0 to 9) plus the decimal point and the algebraical minus sign, the 4th column never utilizes the decimal point or the minus sign.
Of the last column (28th) only the minus sign is utilized.


E
D

Principle of operations of the printing unit

The part that presses the tape against the characters is the Fire hammer 2. The fire hammer is mounted on carriage 1 and can be moved alongside of character drum 3. The ribbon and the tape are placed between the character drum and the Fire hammer.

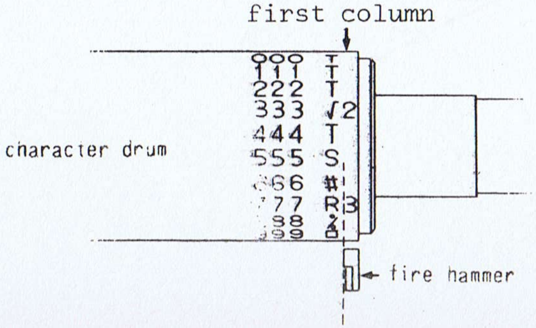


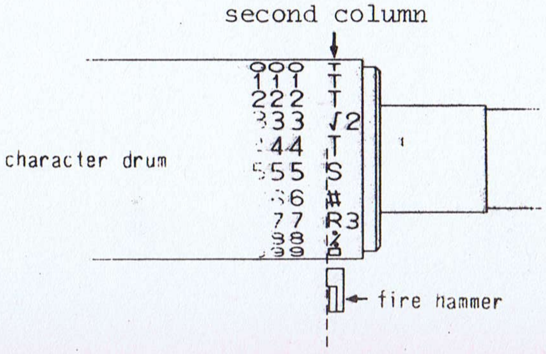


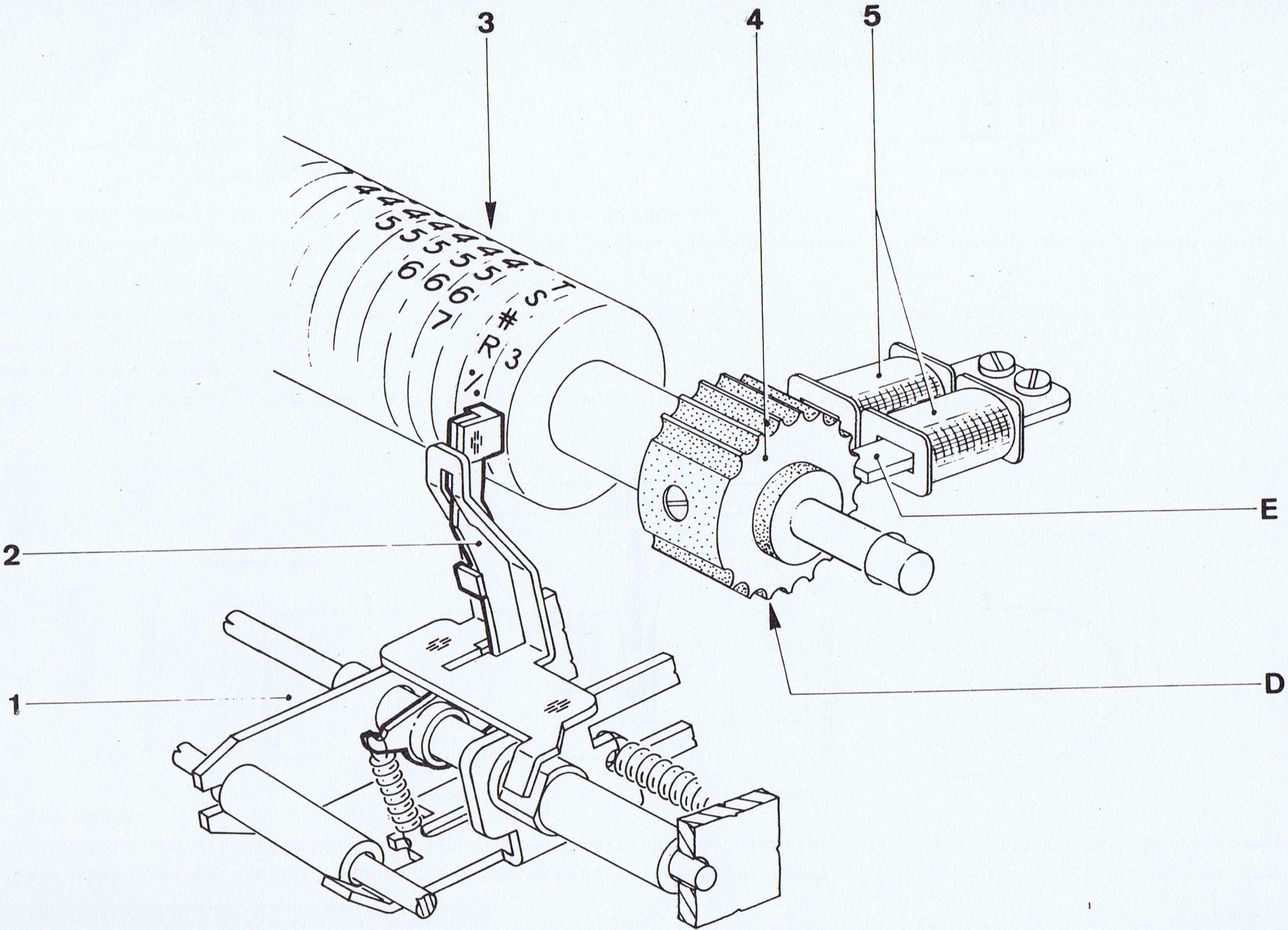
During a printing phase, the characters on the character drum and the Fire hammer are constantly in movement with respect to each other.

- the characters move upward in front of Fire hammer 2
- Fire hammer 2 (carried by carriage 1) is in continuous motion and at a constant speed drives right to left progressively moving in line with the printing columns.

For every revolution of character drum 3, carriage 1 moves from one column to the other. During this movement Fire hammer 2 must be able to strike any character of the column.



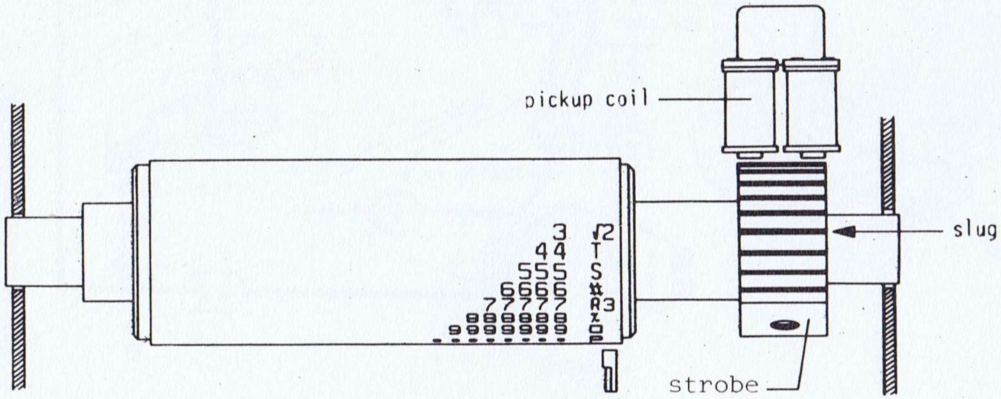



3
4
5
2
1
E
D
4
5
6
7
T
S
#
R
3
%

To be able to print a specific number on the tape it is necessary to know in every instant, starting from the beginning of the printing phase:

- the axial position of carriage 1 with respect to the printing columns
- the angular position that numbers or symbols of every column take occasionally with respect to Fire hammer 2.

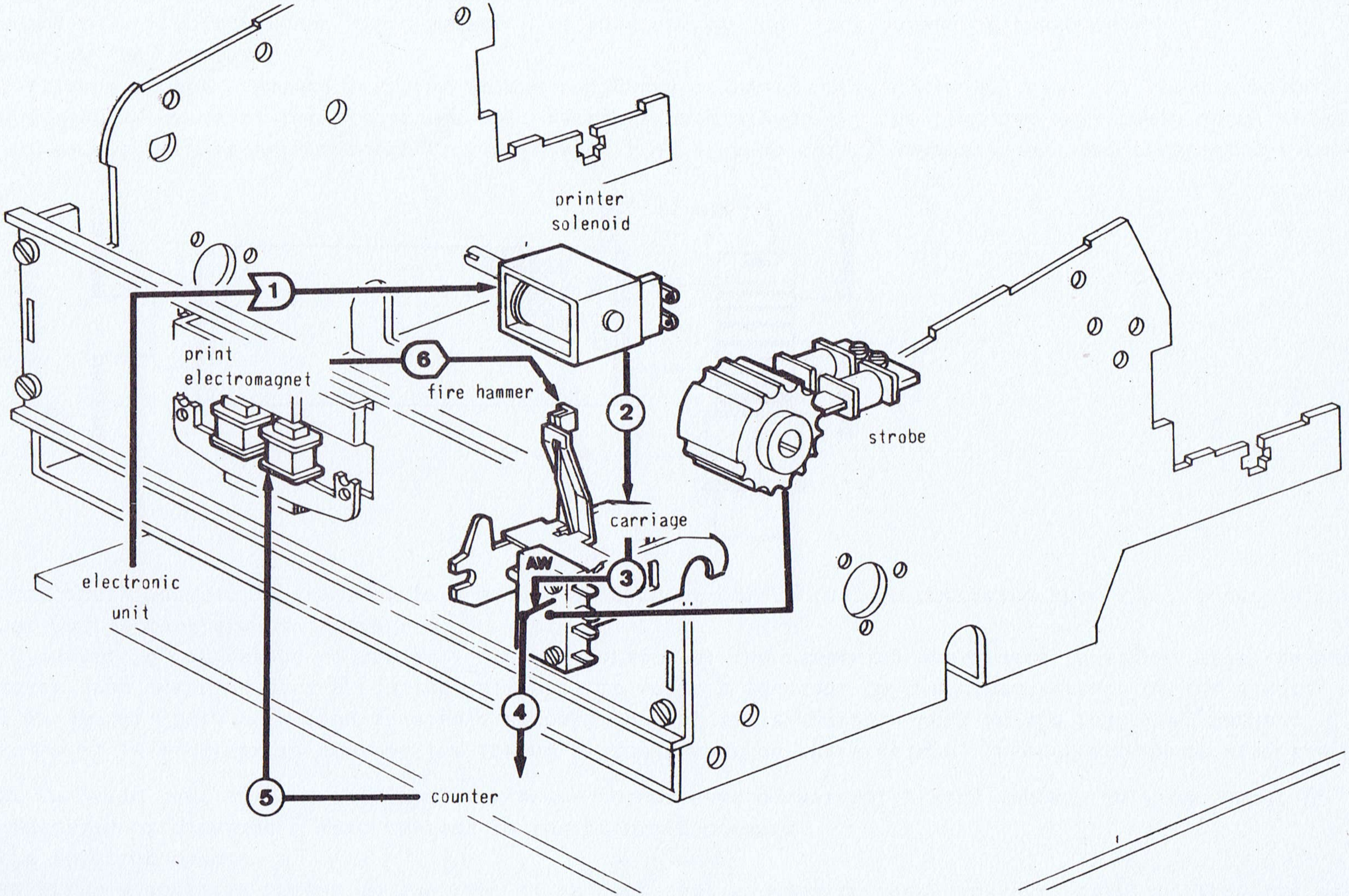
Having this data it is possible to control the firing of the hammer on every column, in correspondence with the desired number or symbol. This selection is always accomplished by the electronic unit in the following manner:
On the character drum shaft, a disk 4 (called "strobe") is solidly mounted. On the circumference of the strobe, 17 slugs D are present: 16 correspond to the 16 lines of characters; the remaining one is used to signal that the character drum has made a complete revolution.
Strobe 4 continuously rotates in front of pole shoe E of pick-up coil 5 that is energized when the power switch closes.



The passing of each slug D in relationship with pole shoe E of pick-up coil 5 generates an electrical singal that is sent to the electronic unit. The electronic unit receives this signal all the time and will begin using it (that is, counting it in a proper counter) starting at the beginning of every printing phase, from the precise moment a proper microswitch (AW) closes.
At the beginning of a printing phase, Fire hammer 2 is in front of the first column of characters.
It will strike character drum 3 whenever the number of signals sent by strobe 4 corresponds to the digit to be printed.
When the character drum 3 has completed the first revolution, Fire hammer 2 will be found in front of the second column of characters. The printing of the second and of successive digits will occur, therefore, in a serial mode.
Once the last digit is printed, the electronic unit will control the return of carriage 1 to its starting position.
In this condition the AW microswitch is reopened ending the printing phase.

The connection between the electronic unit and the printing unit is realized through printer solenoid - strobe - print electromagnet.

A printing phase can be summarized in the following manner:



① Beginning of the printing phase (= printer solenoid energized)

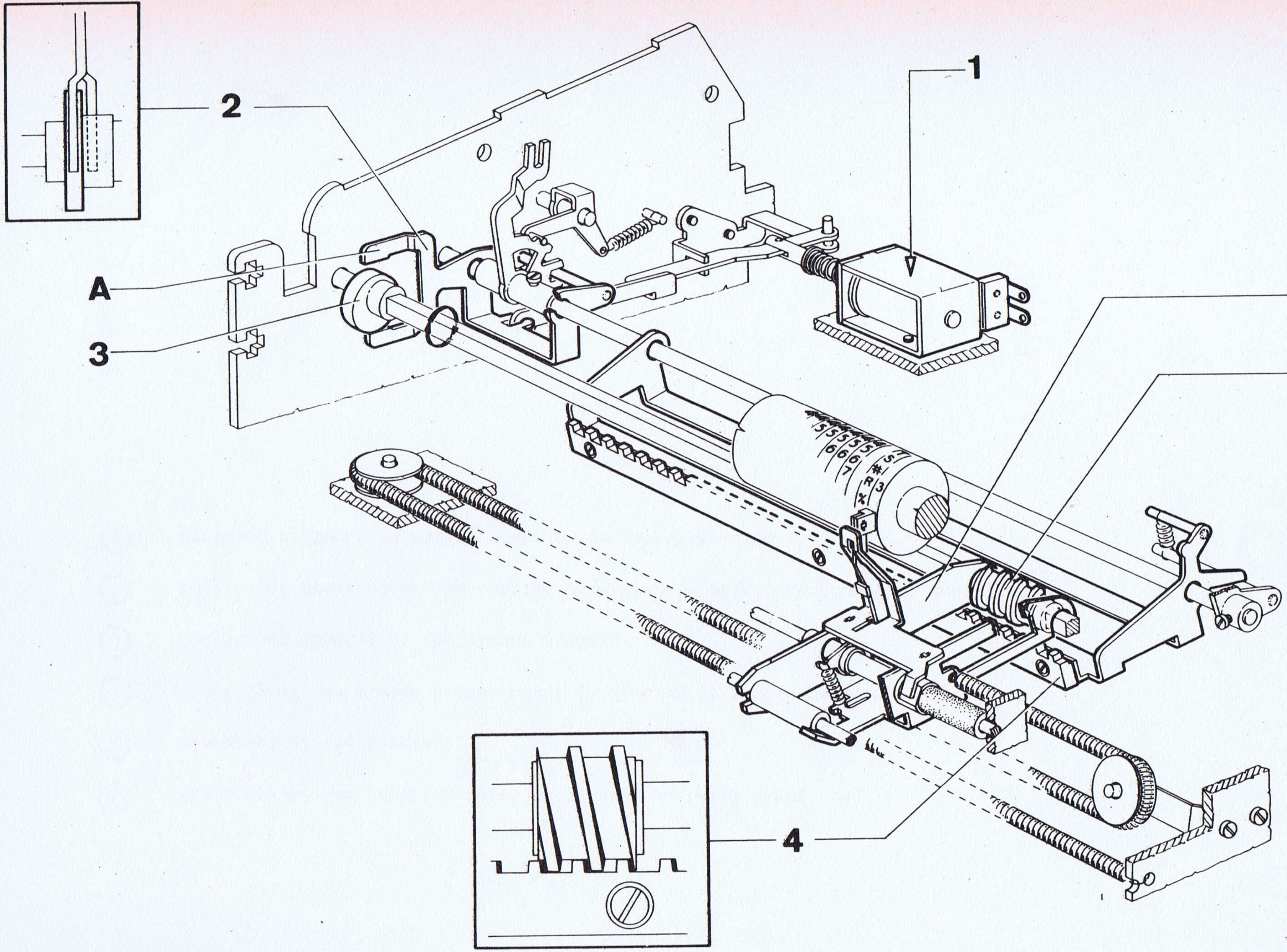
② Departure of the carriage

③ Starting of the strobe signal count (= closing of AW microswitch)

④ Continuous sending of the strobe signals

⑤ Control of printing of the counted character (= print electromagnet energized)

⑥ Striking of the Fire hammer towards the character drum


A

Carriage movement

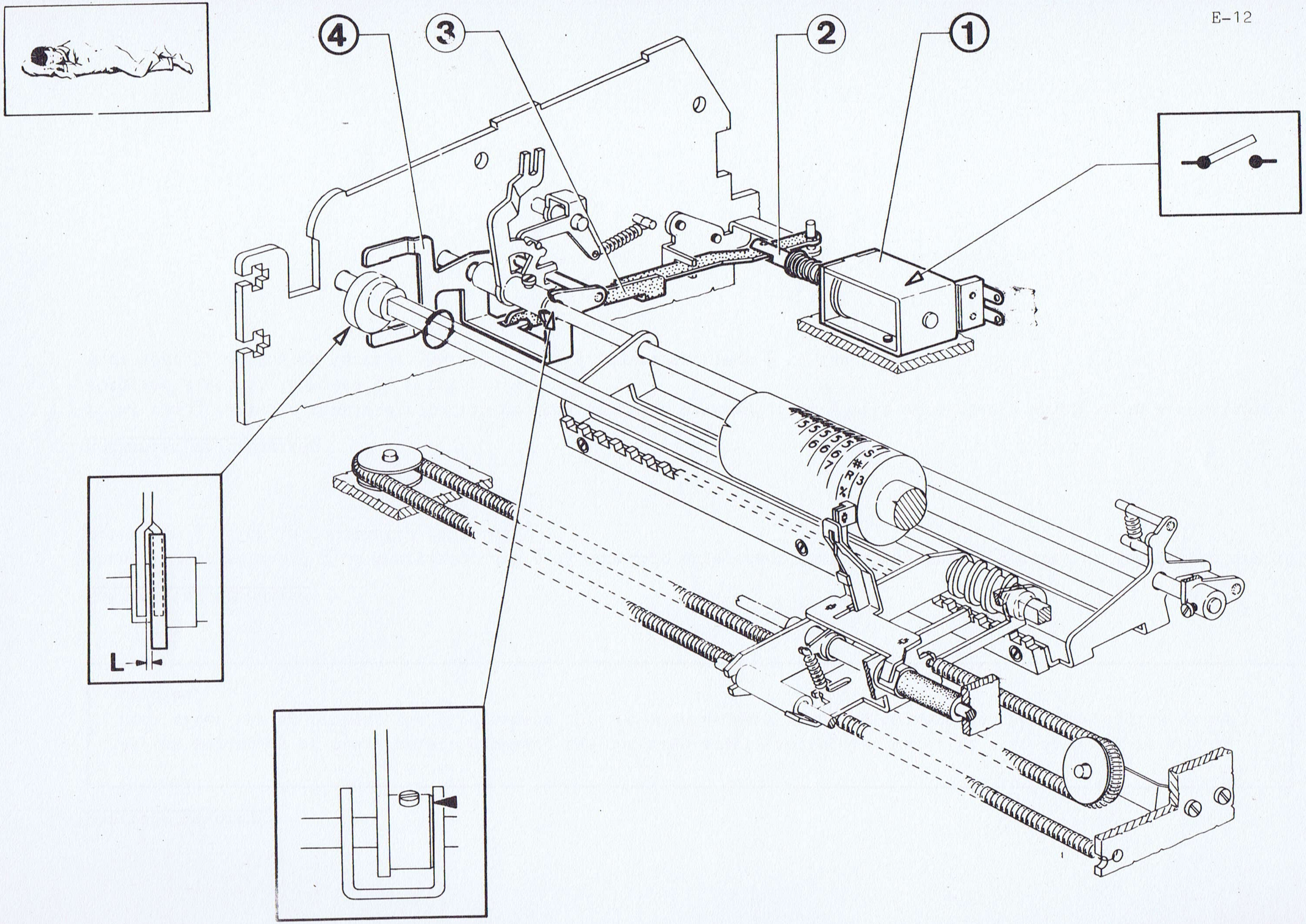
At the beginning of every printing phase, the carriage starts moving leftward. It will stop and return to rest after having brought the Fire hammer in line with as many printing columns as there are digits to be printed.

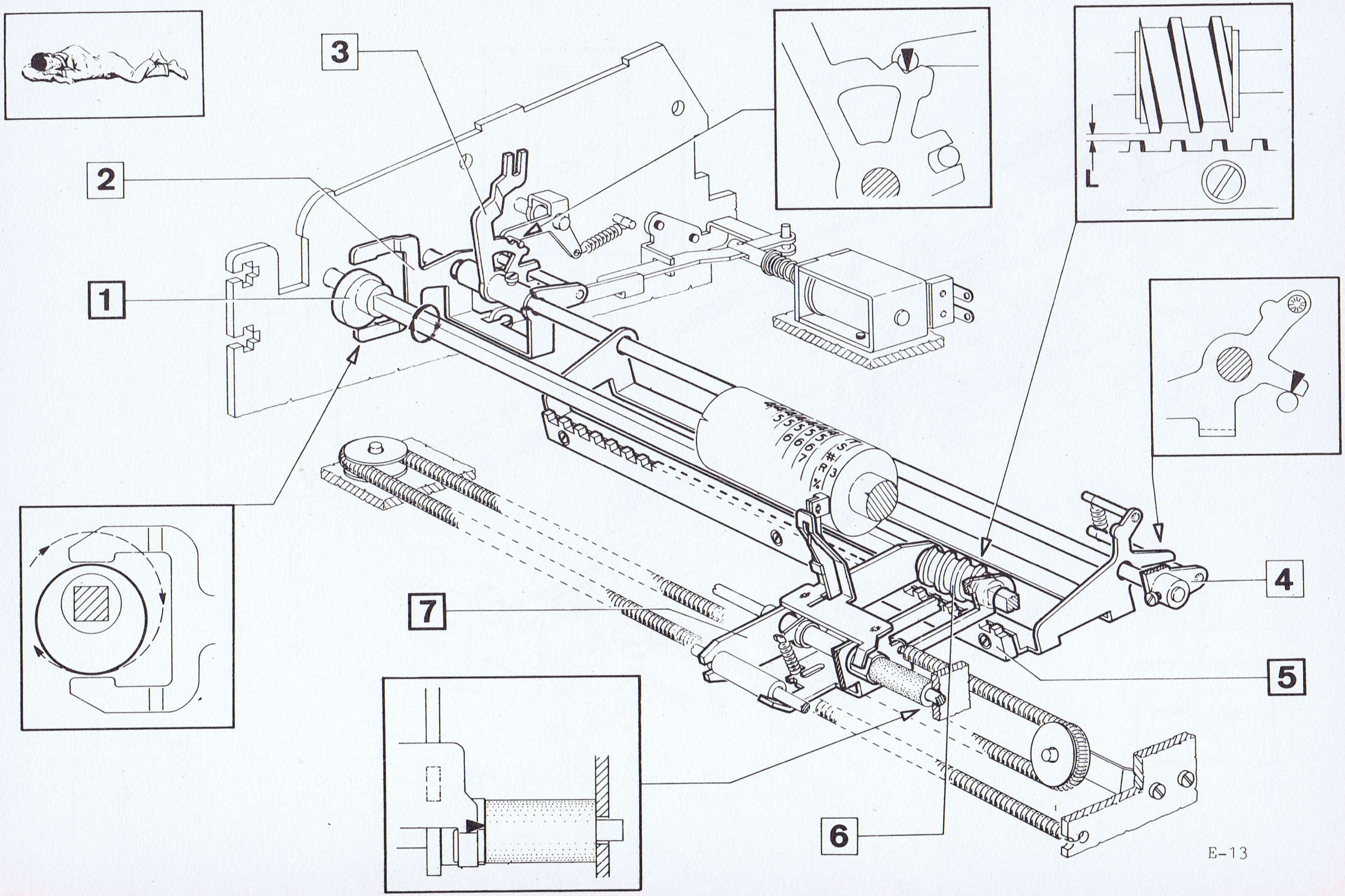
Controlling mechanism

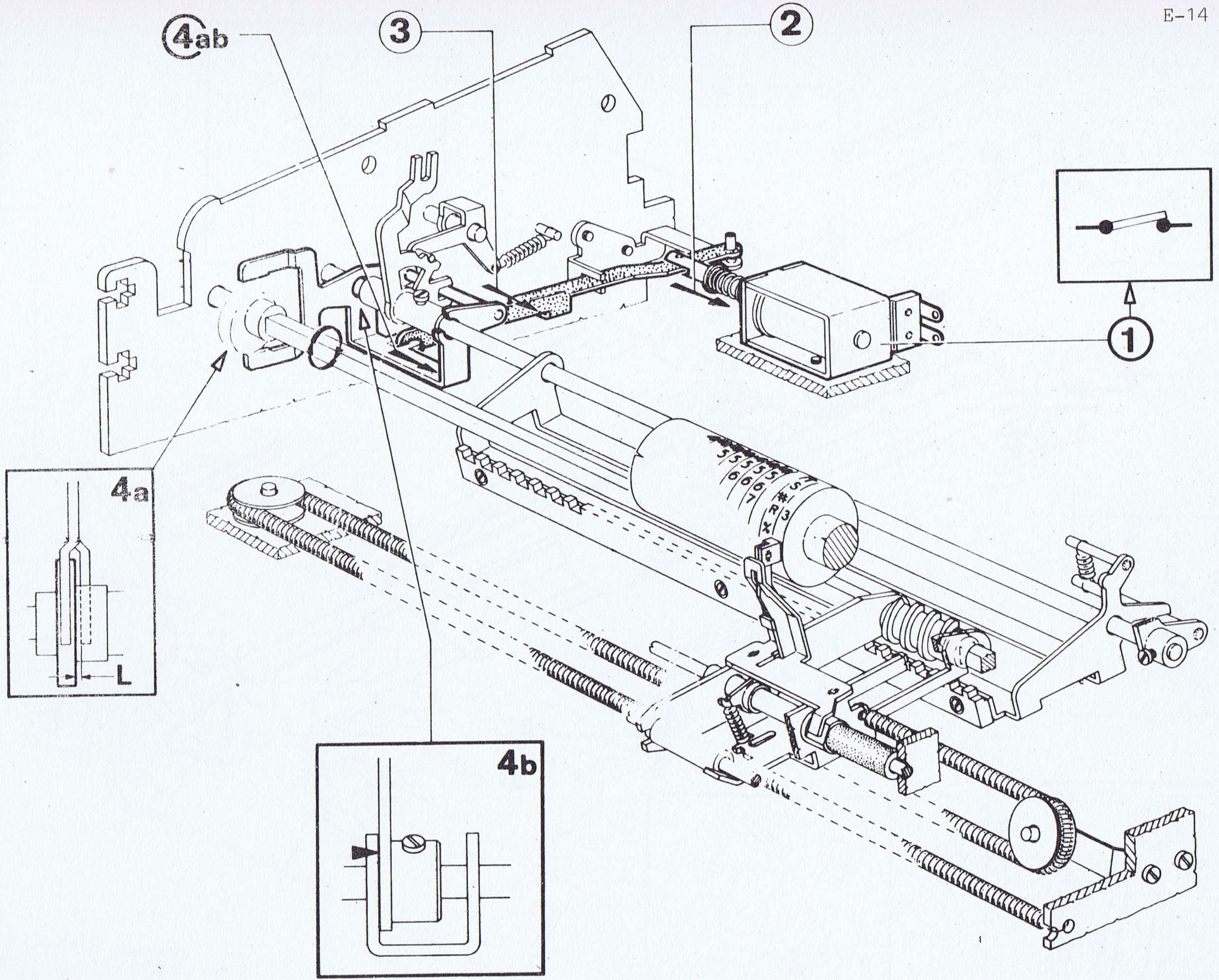
When printer solenoid 1 is energized, arm A of carriage engagement controlling bridge 2 moves on the trajectory of print cam 3 which is constantly rotating.

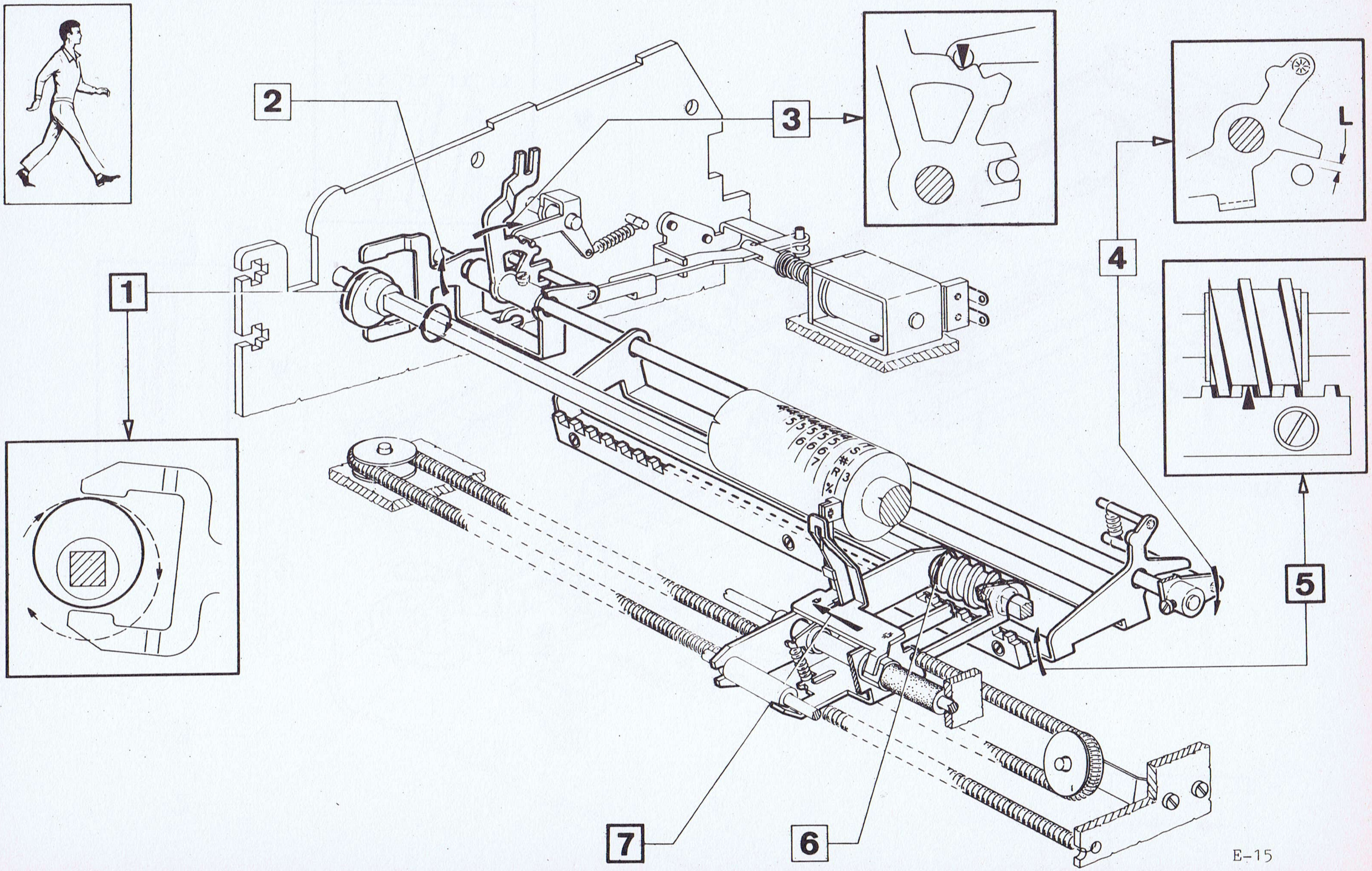
Mechanism of execution

Print cam 3 during a complete rotation engages carriage movement rack 4 with worm gear 5 which is in a continuous rotation since it is mated to print cam 3.
Worm gear 5, acting on carriage movement rack 4, moves carriage 6 to the left.

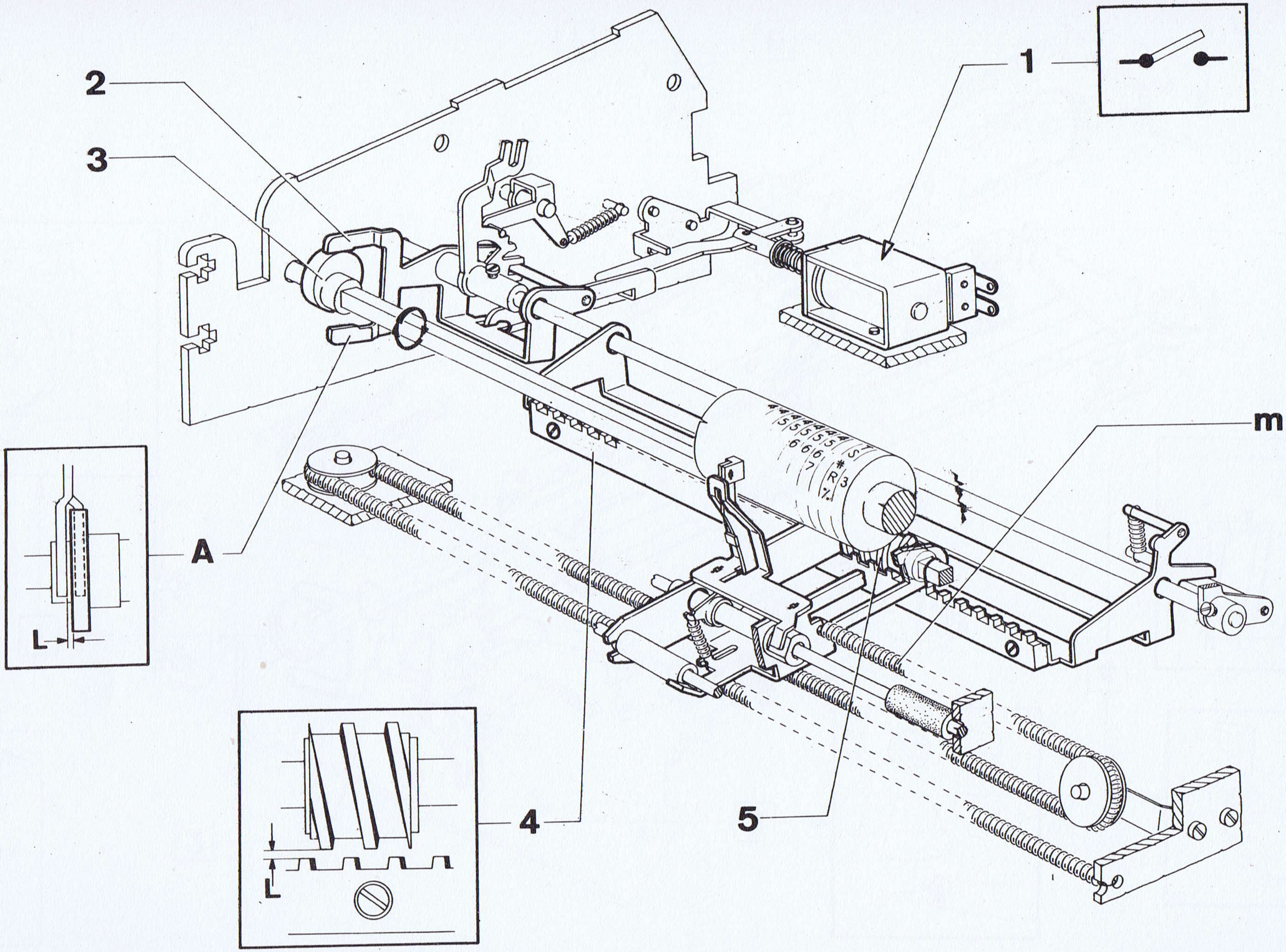

④
③
②
①
L


L


4ab
3
2
1
4a
L
4b



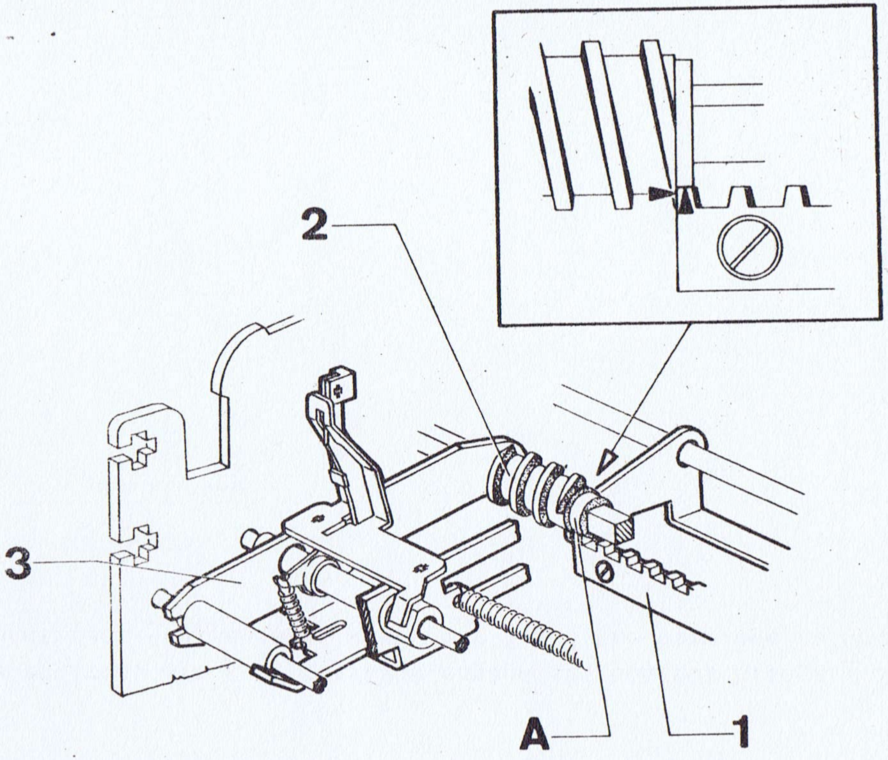
L


1
2
3
m
A
L
4
L
5

Carriage return

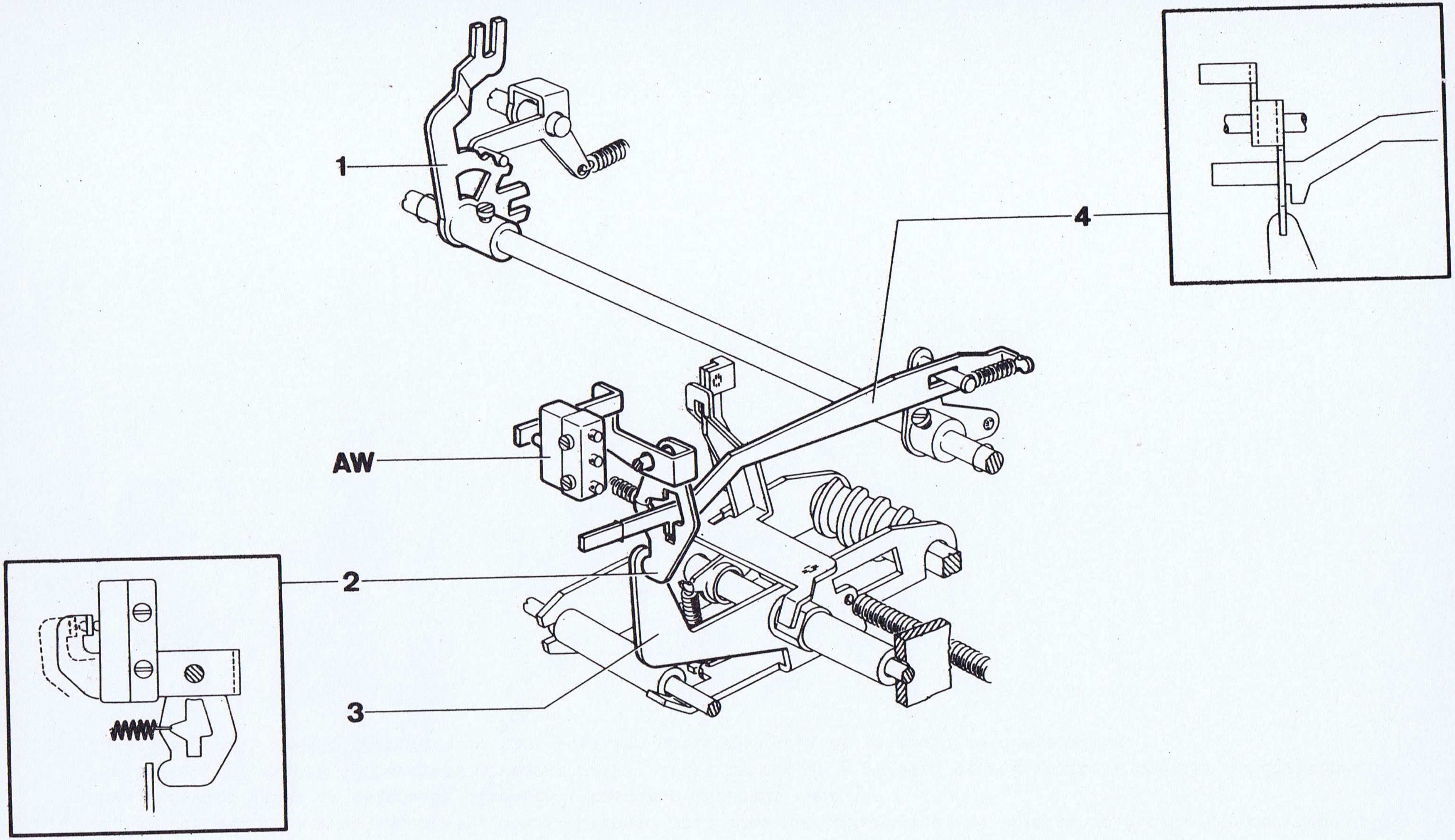
At the end of a printing phase, the carriage returns to rest.

When printer solenoid 1 deenergizes, arm A of carriage engagement control bridge 2 is moved on the trajectory of print cam 3. Carriage movement rack 4 disengages worm gear 5 and the carriage returns to rest by the action of spring m.


A

Stopping of the carriage at the fully leftward travel

If, at the end of a printing phase, the electronic unit does not deenergize the printer solenoid, the carriage will move leftward until it laterally disengages carriage movement rack 1.
The last, left, tooth of carriage movement rack 1 drops on collar A of worm gear 2 which is smaller in diameter.
Carriage 3 will remain therefore in that position until the printer solenoid is deenergized.

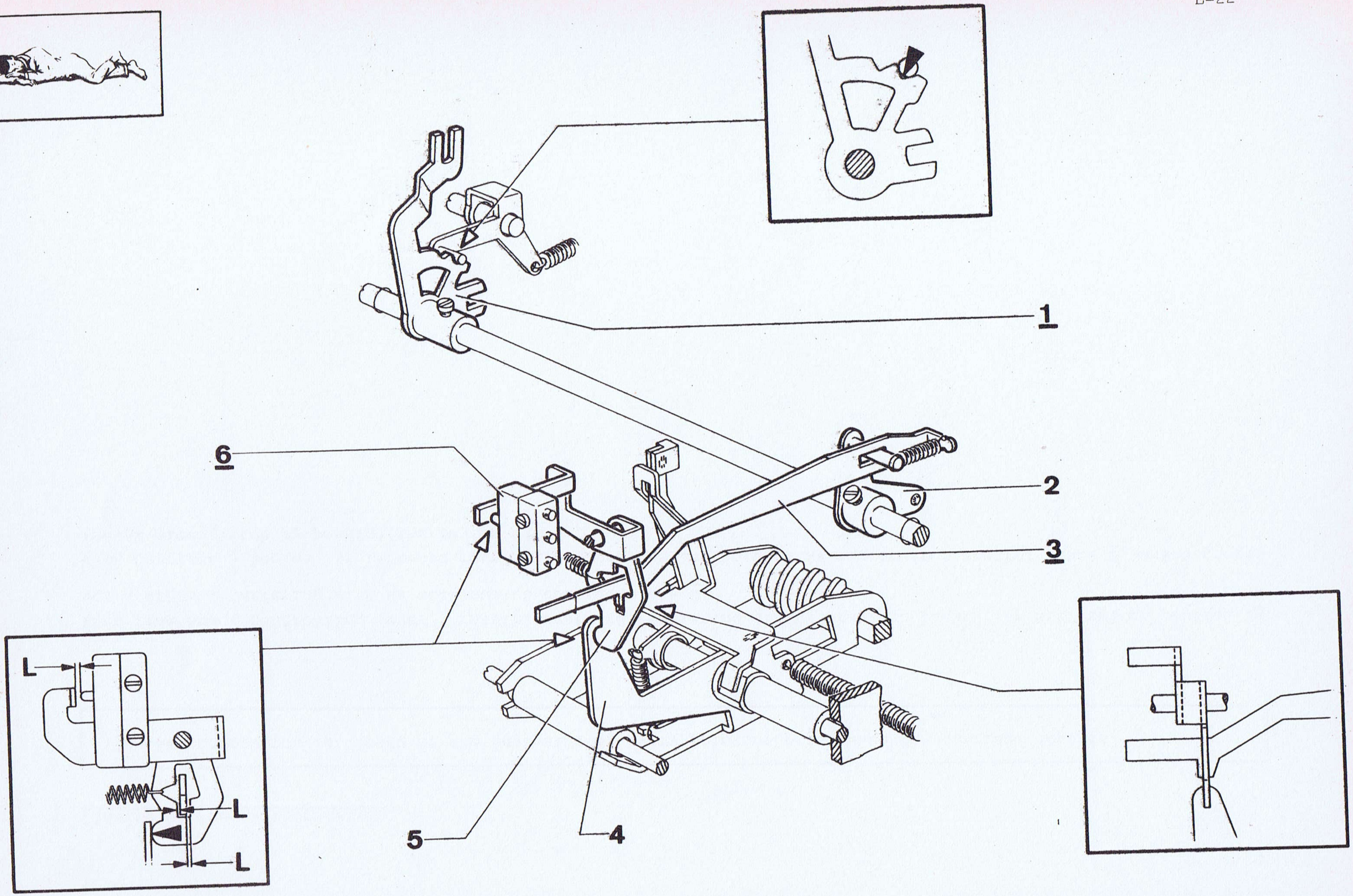

AW

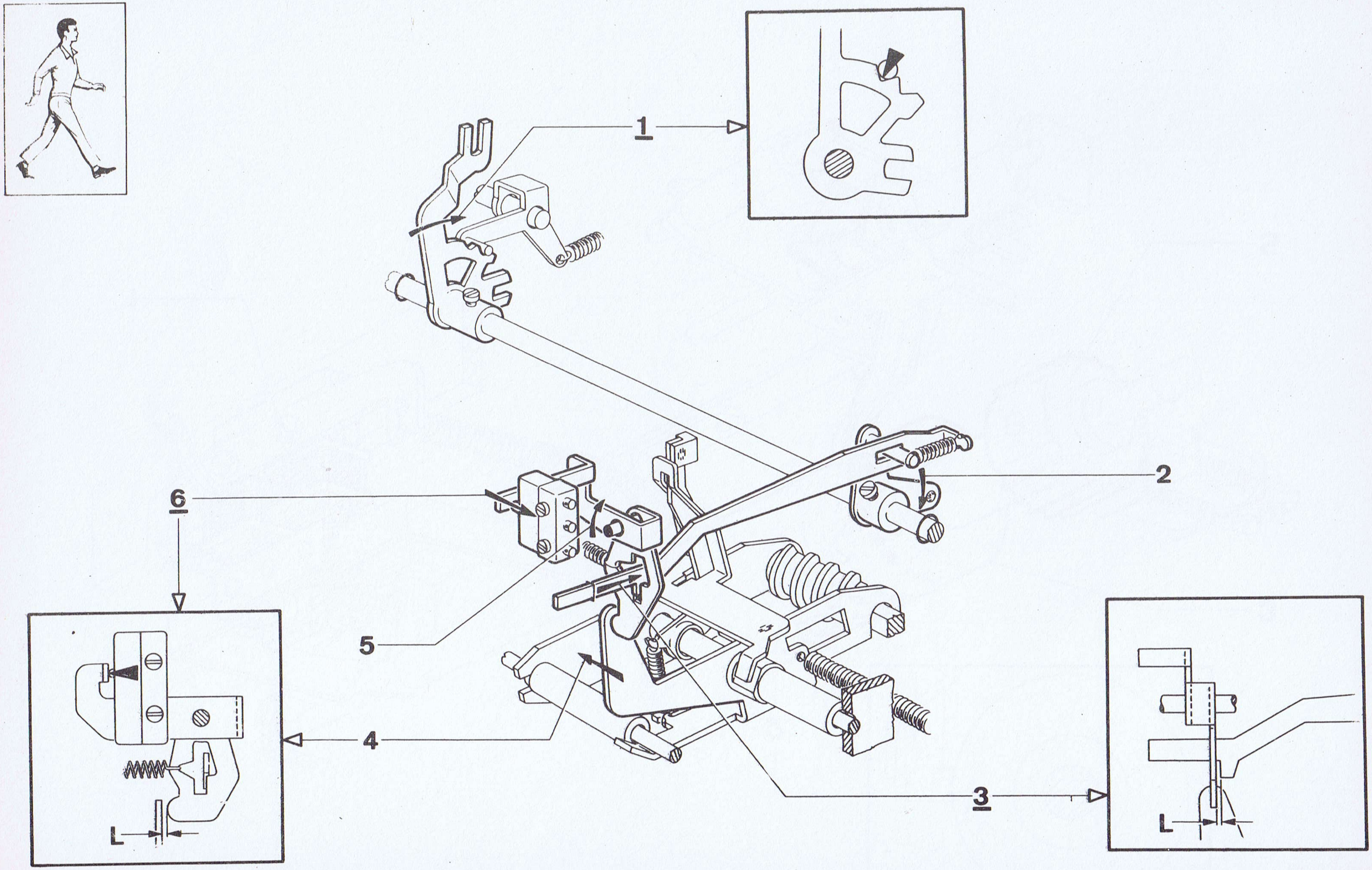
Closing of the AW microswitch

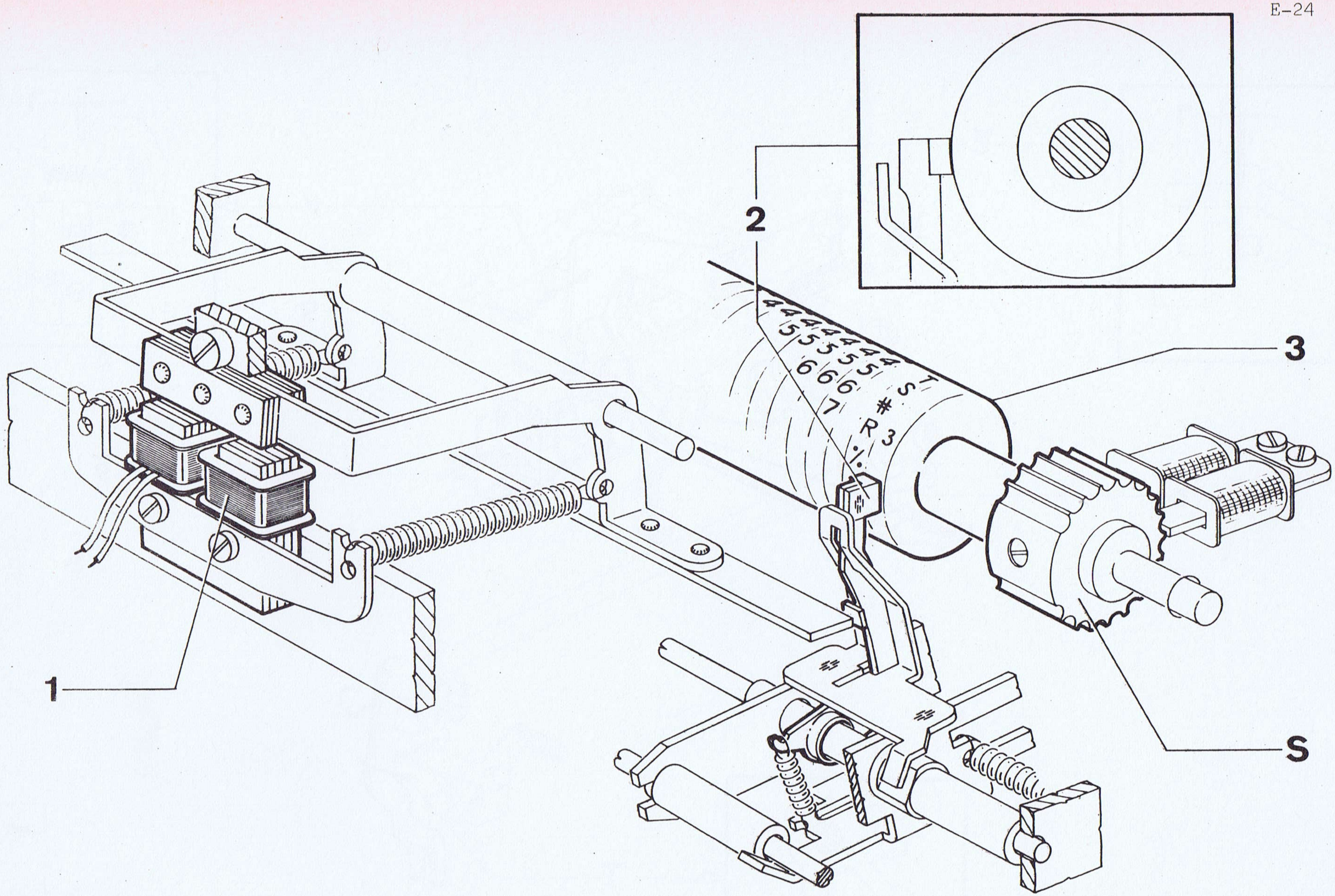
The AW microswitch is closed at the beginning of every printing phase when the carriage departs.

When line space controlling lever 1 rotates rearward (beginning of the printing phase), AW microswitch control lever 4 stops interfering with AW microswitch control plate 2.

When carriage 3 begins its leftward movement, it removes its hold on AW microswitch control plate 2, which closes the AW microswitch by pushing the button in.


L
L
L

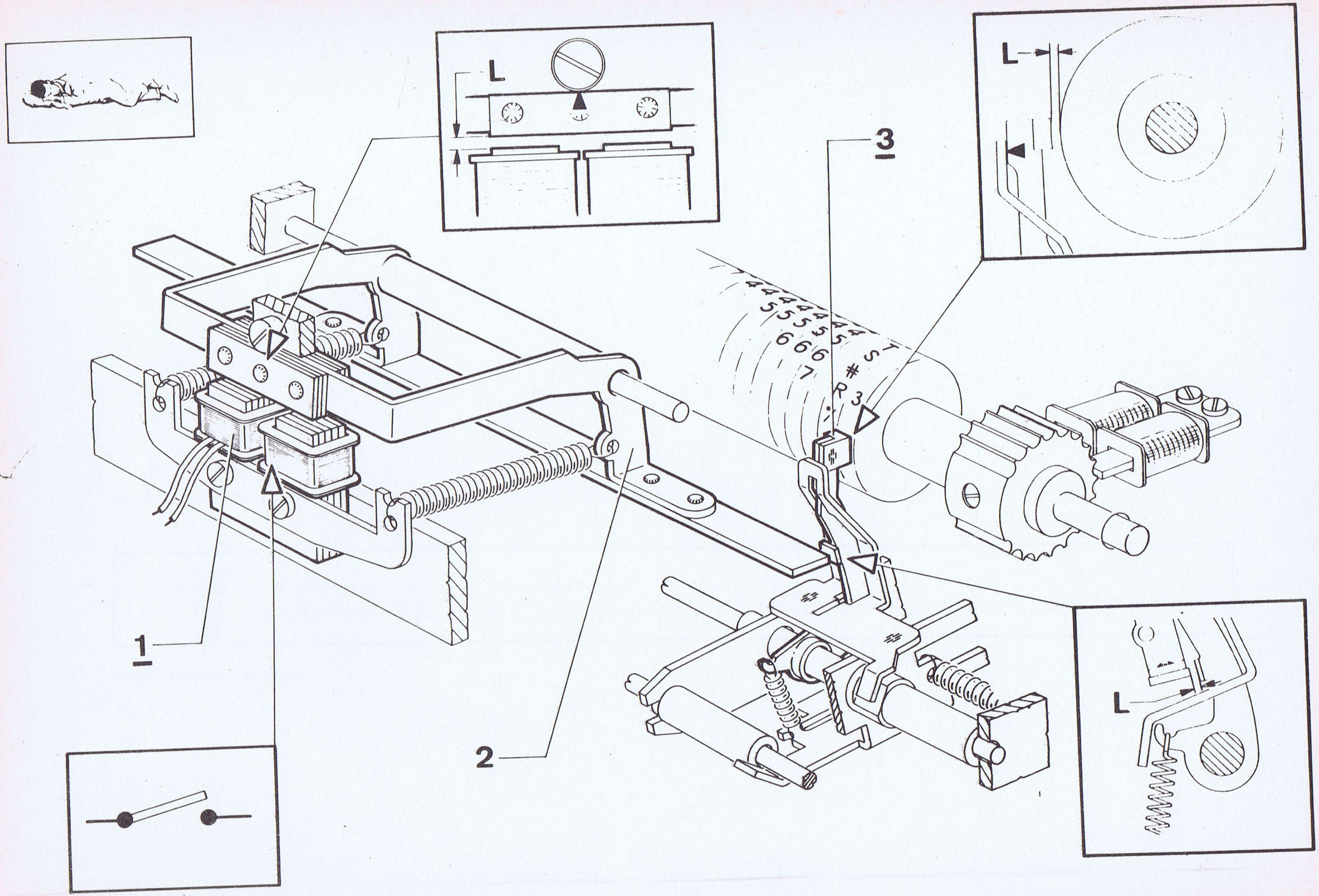

L
L

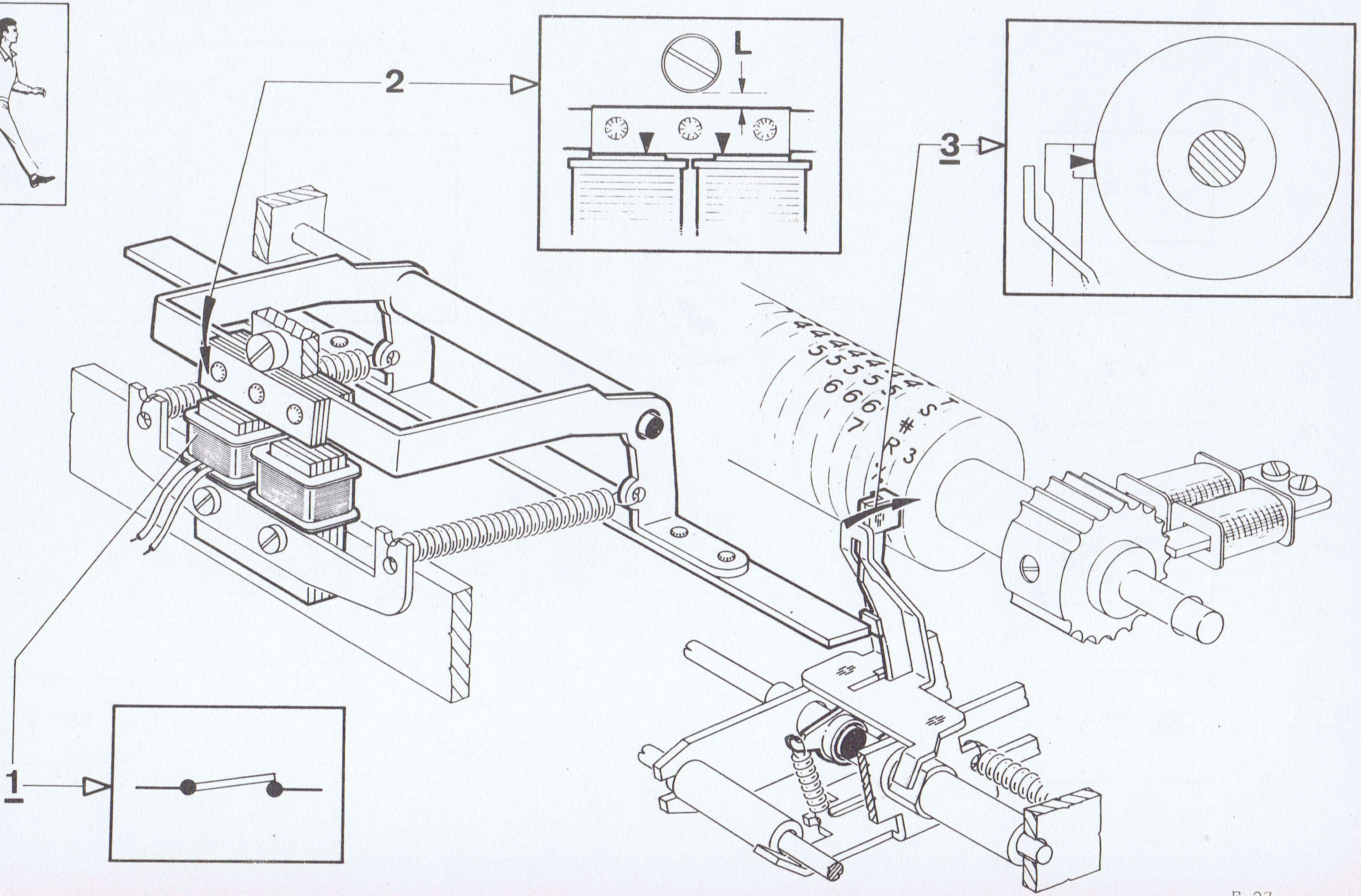

2
3
S
1
4
4 4 4 4 4 4
5 5 5 5 5 5 5
6 6 6
7
T
S
#
R
3
%

Firing of the hammer

Following the indications of "strobe" S, the electronic unit controls the striking of the hammer towards the character drum by energizing print electromagnet 1.

When print electromagnet 1 is energized, hammer 2 is moved in contact with character drum 3.

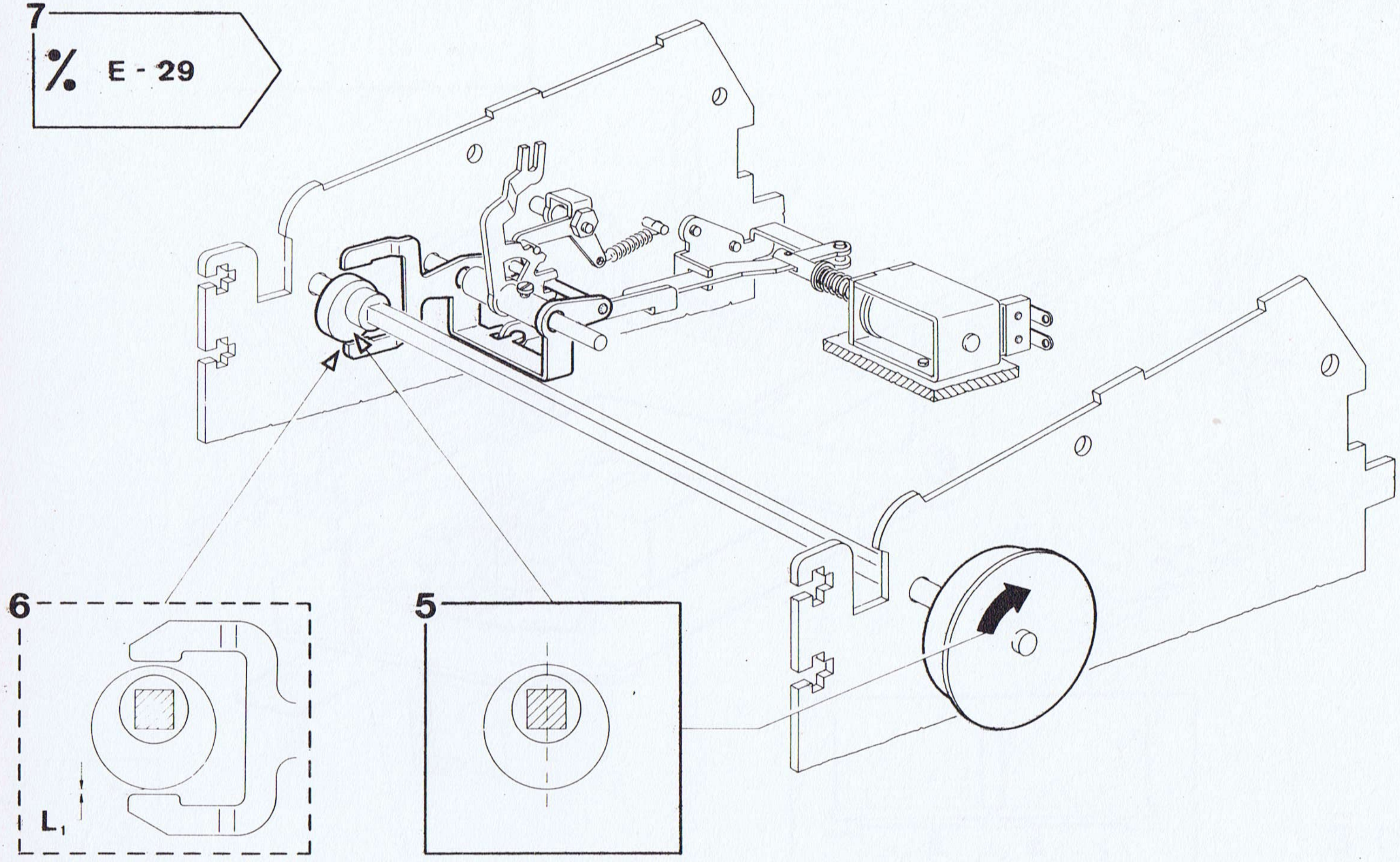

L
3
L
R
L
1
2


2
L
3
1

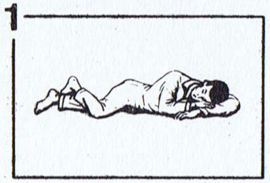
ADJUSTING THE ANGULAR POSITION OF THE CARRIAGE ENGAGEMENT CONTROLLING BRIDGE

In every printing phase, the carriage engagement controlling bridge must be able to freely engage its two arms on the print cam.

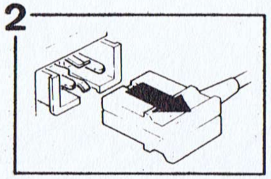
7 % E - 29



1



2

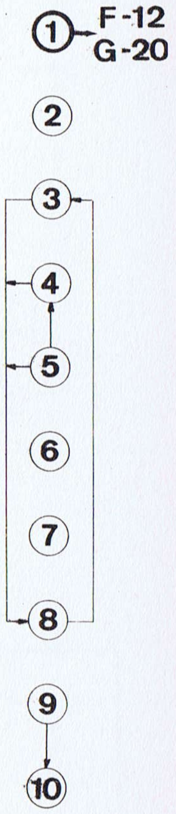


3

Z - 6

4

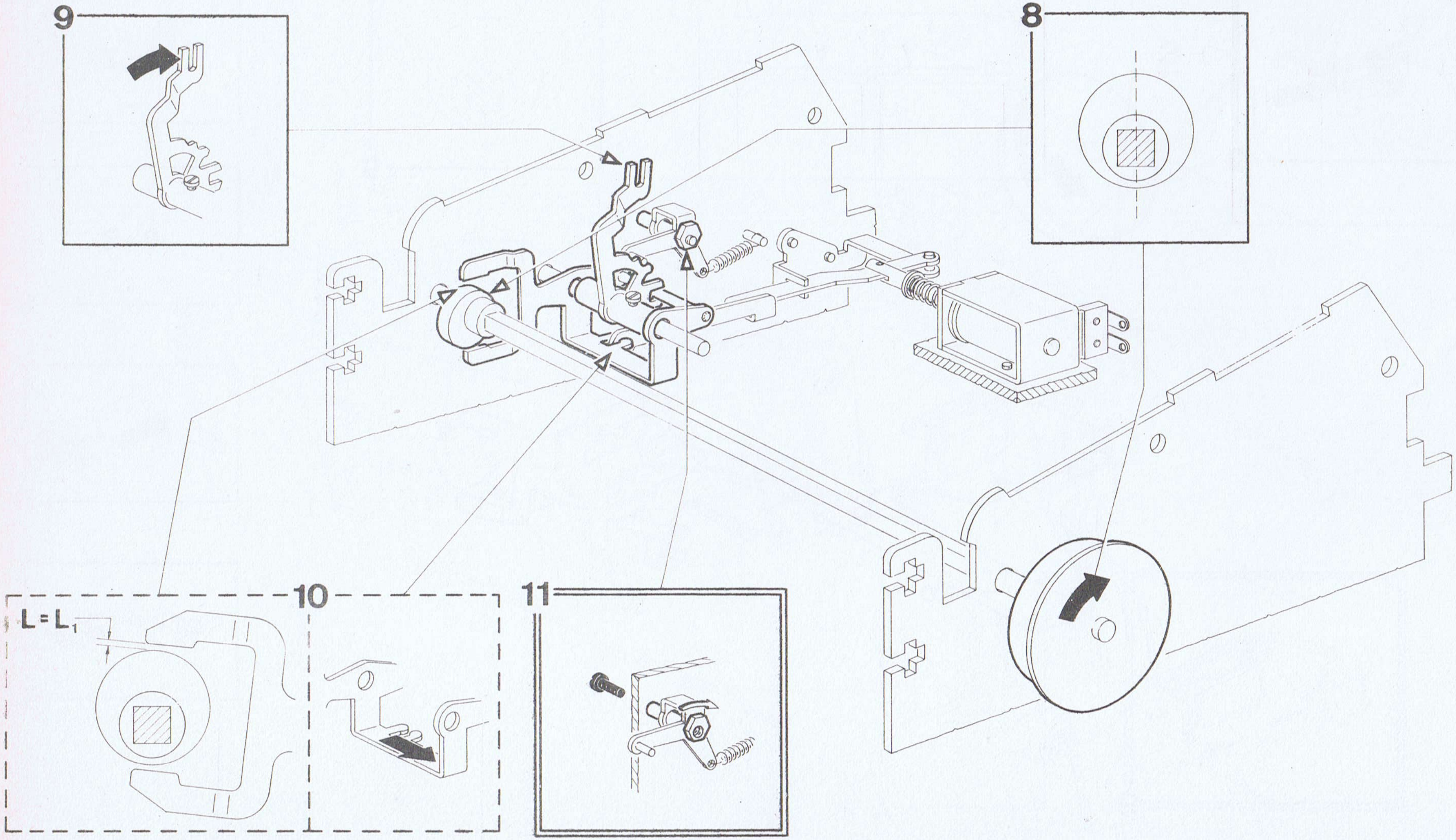
Z - 7

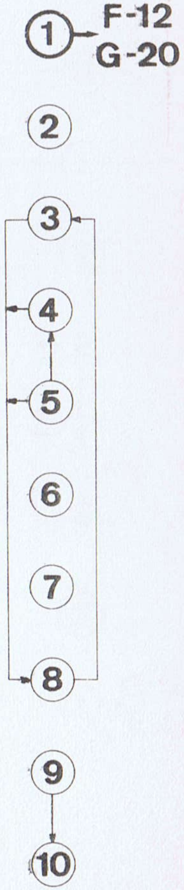


(Z-6, Paper cutter removal)

(Z-7, Removal of the AW plate)

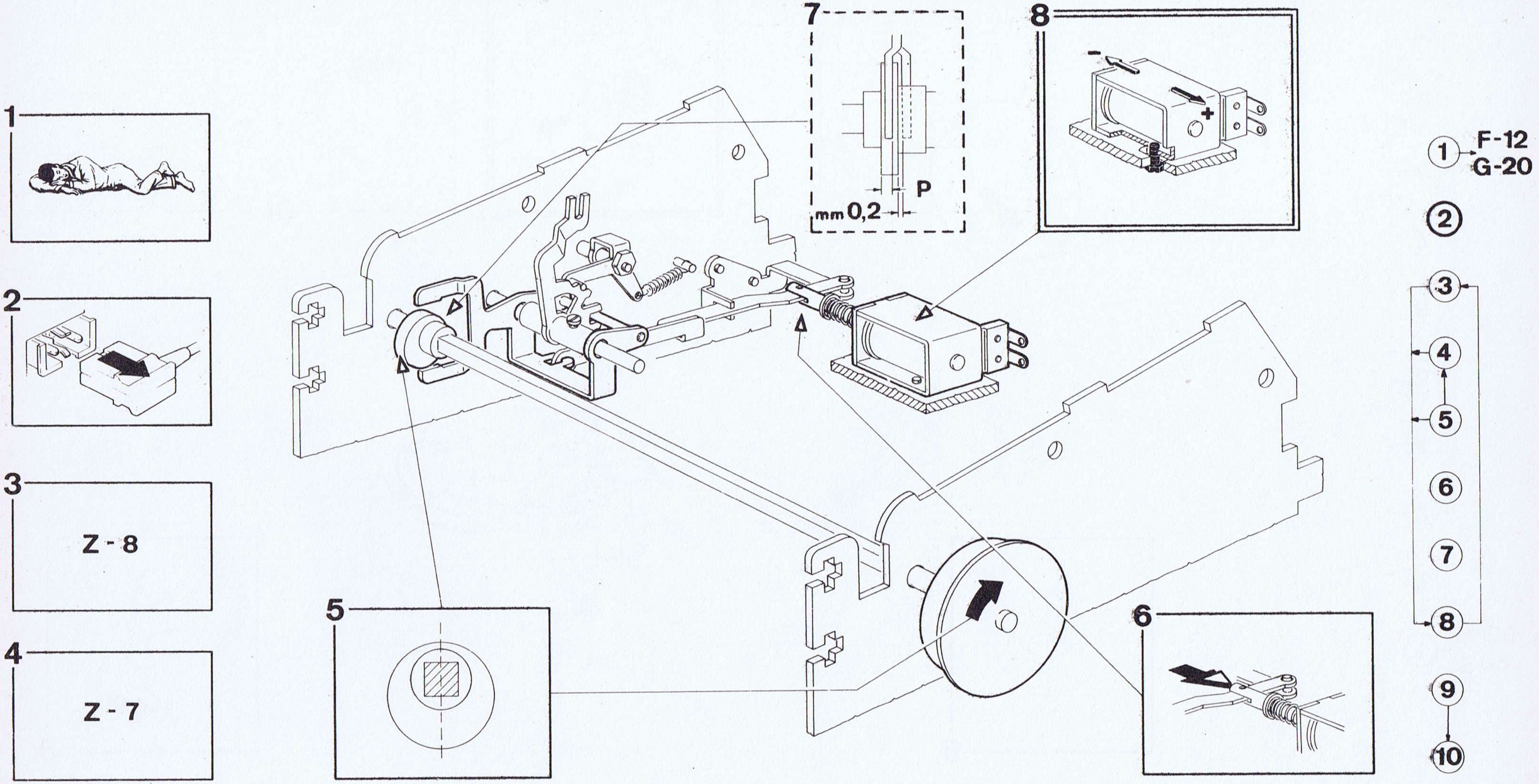
ADJUSTING THE ANGULAR POSITION OF THE CARRIAGE ENGAGEMENT CONTROLLING BRIDGE (continuation)





ADJUSTING THE AMOUNT OF PRINTER SOLENOID CONTROL

At the beginning of every printing phase, the condition illustrated on page E-10 (frame 2) must be achieved.

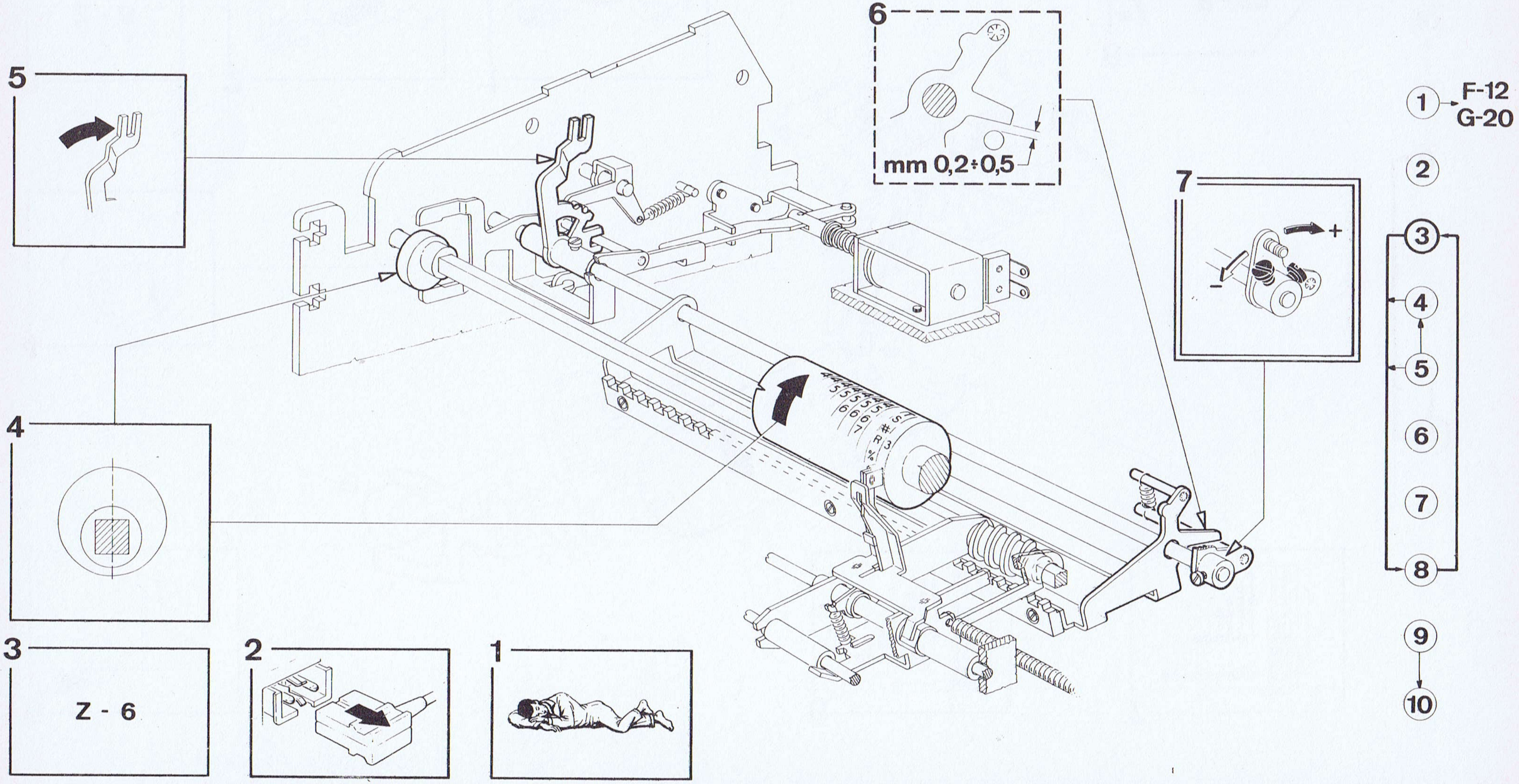


(Z-7, Removal of the AW plate)

(Z-8, Print unit removal)

ADJUSTING THE ENGAGEMENT OF THE CARRIAGE MOVEMENT RACK

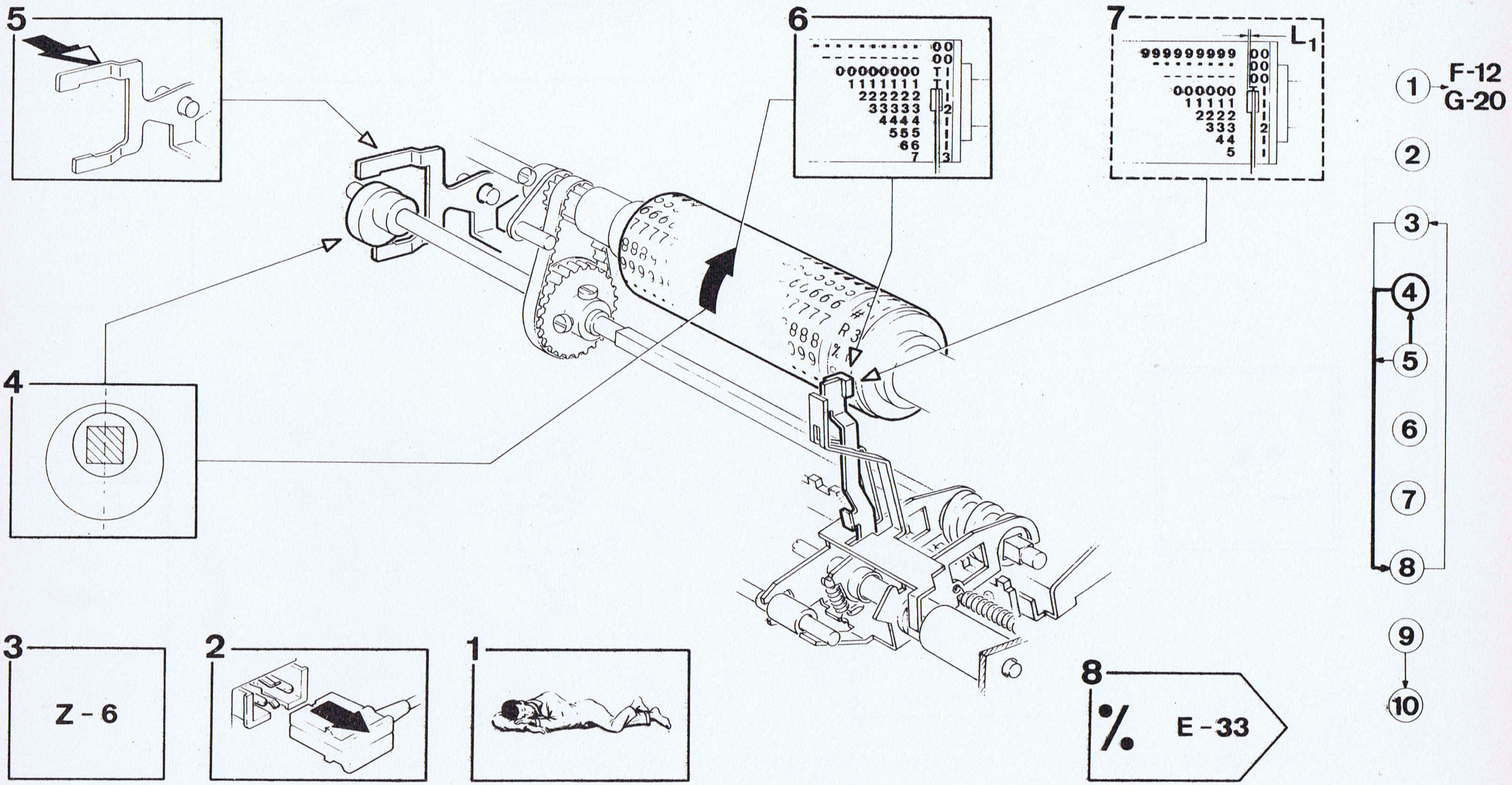
At the beginning of every printing phase, the condition shown on page E-10 (frame 4) must be achieved.



(Z-6, Paper cutter removal)

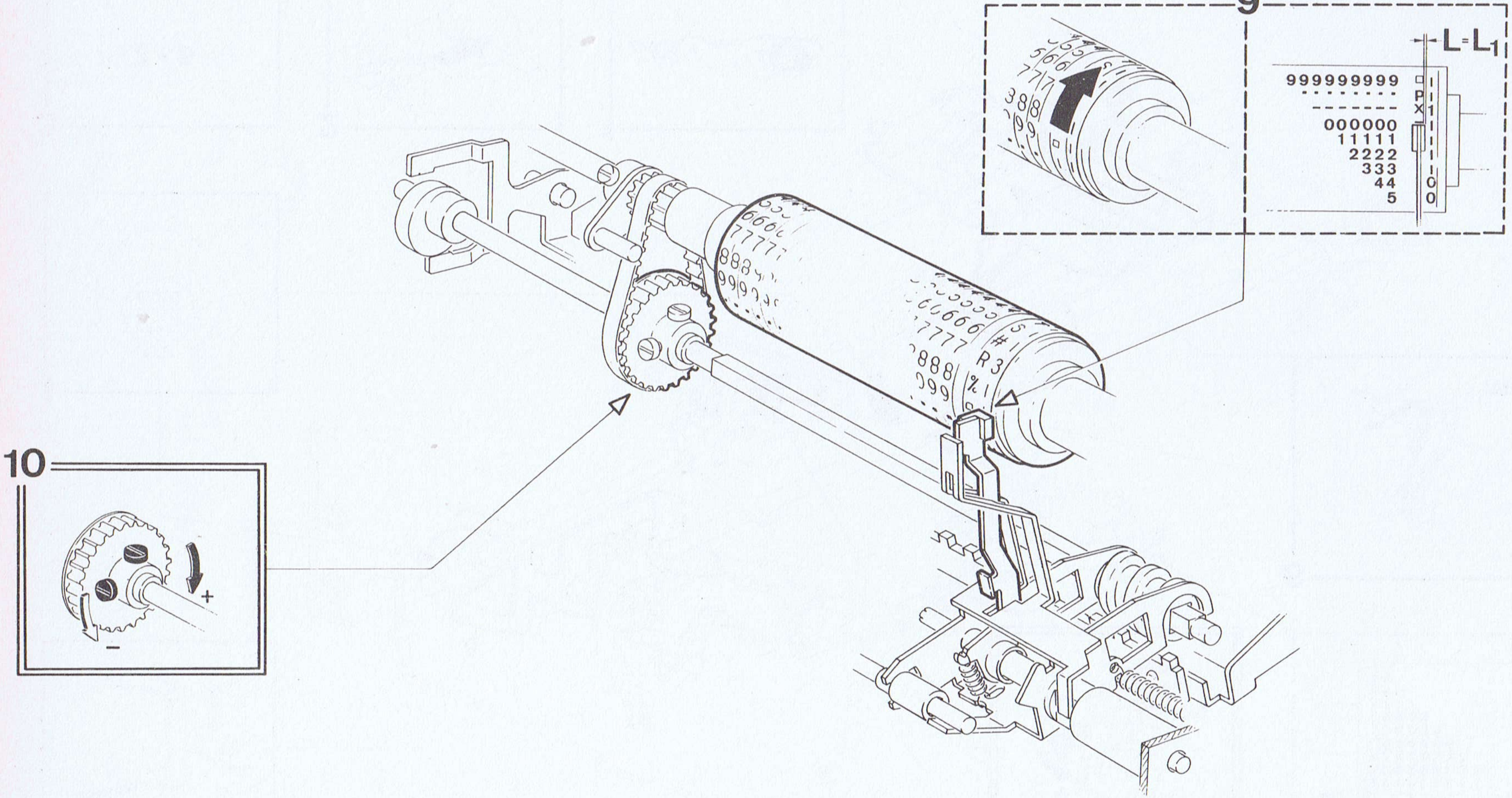
ADJUSTING THE TIMING BETWEEN THE CHARACTER DRUM AND THE CARRIAGE MOVEMENT RACK

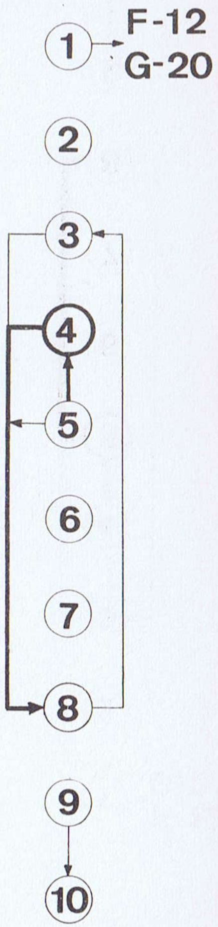
During a complete revolution of the character drum, the Fire hammer must be able to strike any one of the characters of a column.



(Z-6, Paper cutter removal)

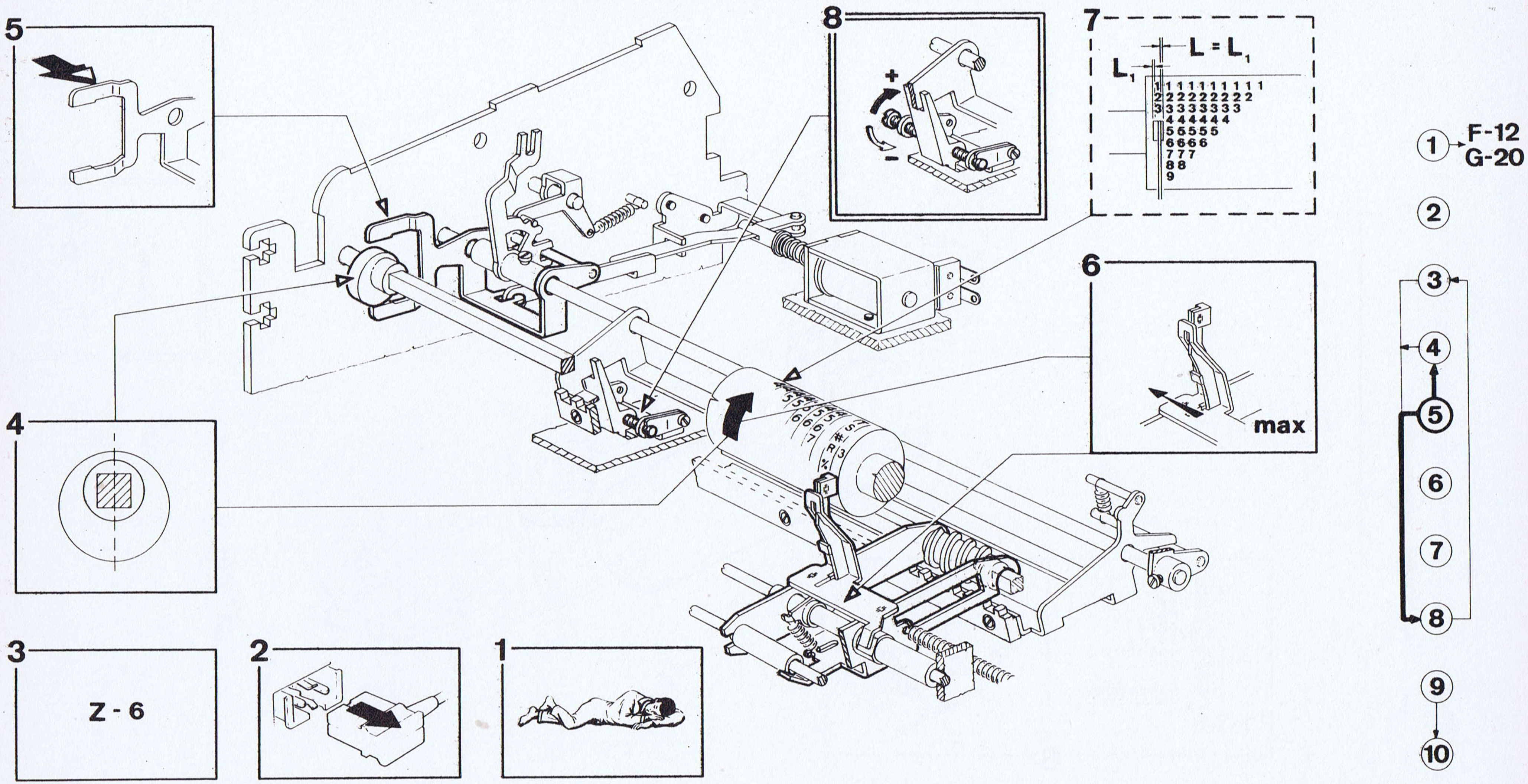
ADJUSTING THE TIMING BETWEEN THE CHARACTER DRUM AND THE CARRIAGE MOVEMENT RACK (continuation)





ADJUSTING THE MAXIMUM TRAVEL OF THE CARRIAGE

With the carriage at its maximum travel, the Fire hammer must be able to strike anyone of the characters of the last column.

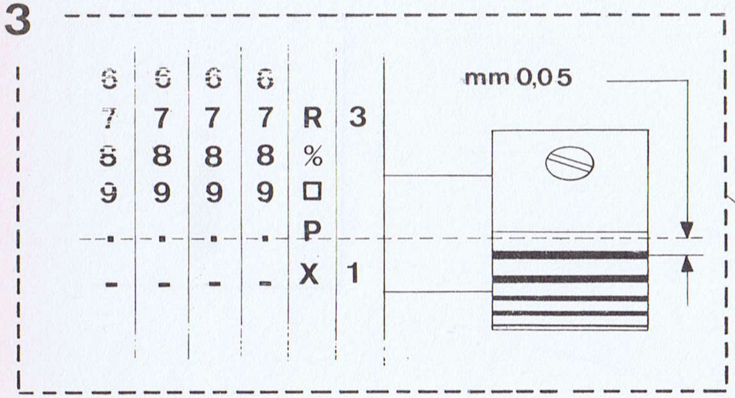


(Z-6, Paper cutter removal)

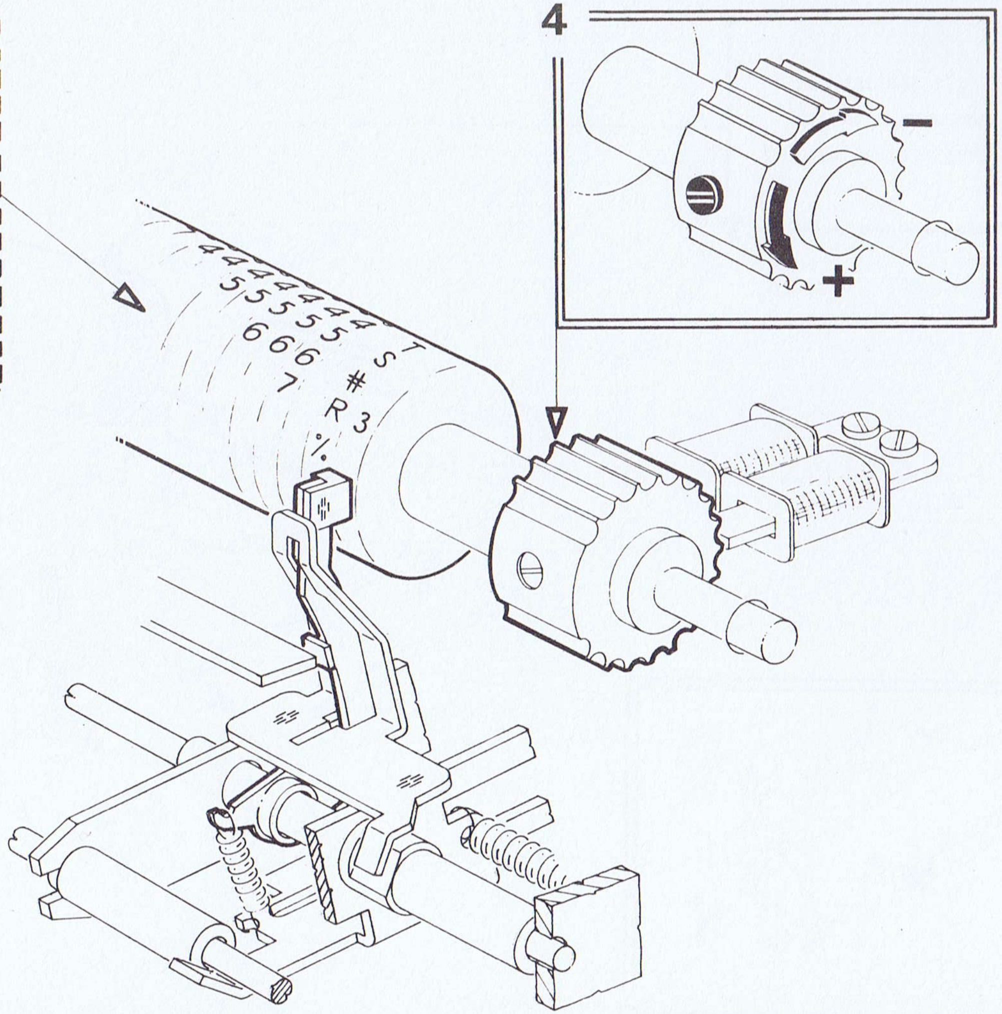
ADJUSTING THE TIMING BETWEEN THE STROBE WHEEL AND THE CHARACTER DRUM

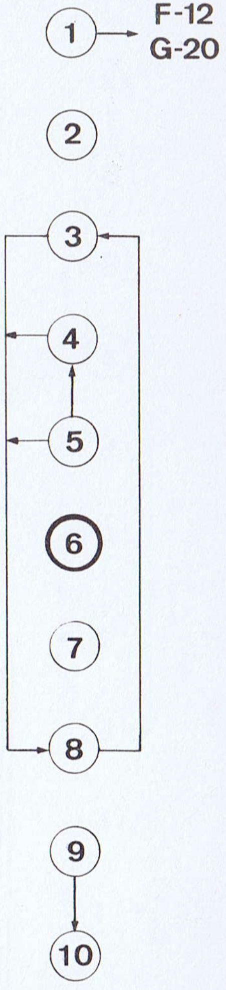
The strobe must be properly timed with respect to the character lines of the character drum.

3



4





2

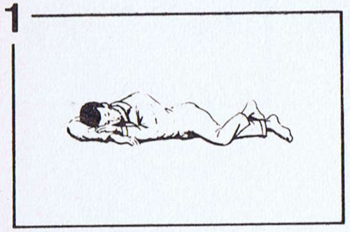
Z-6

1

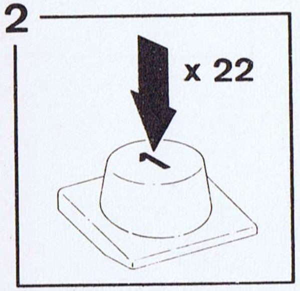
(Z-6, Paper cutter removal)

ADJUSTING THE POSITION OF THE PICK UP COIL

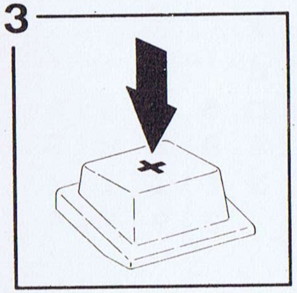
1

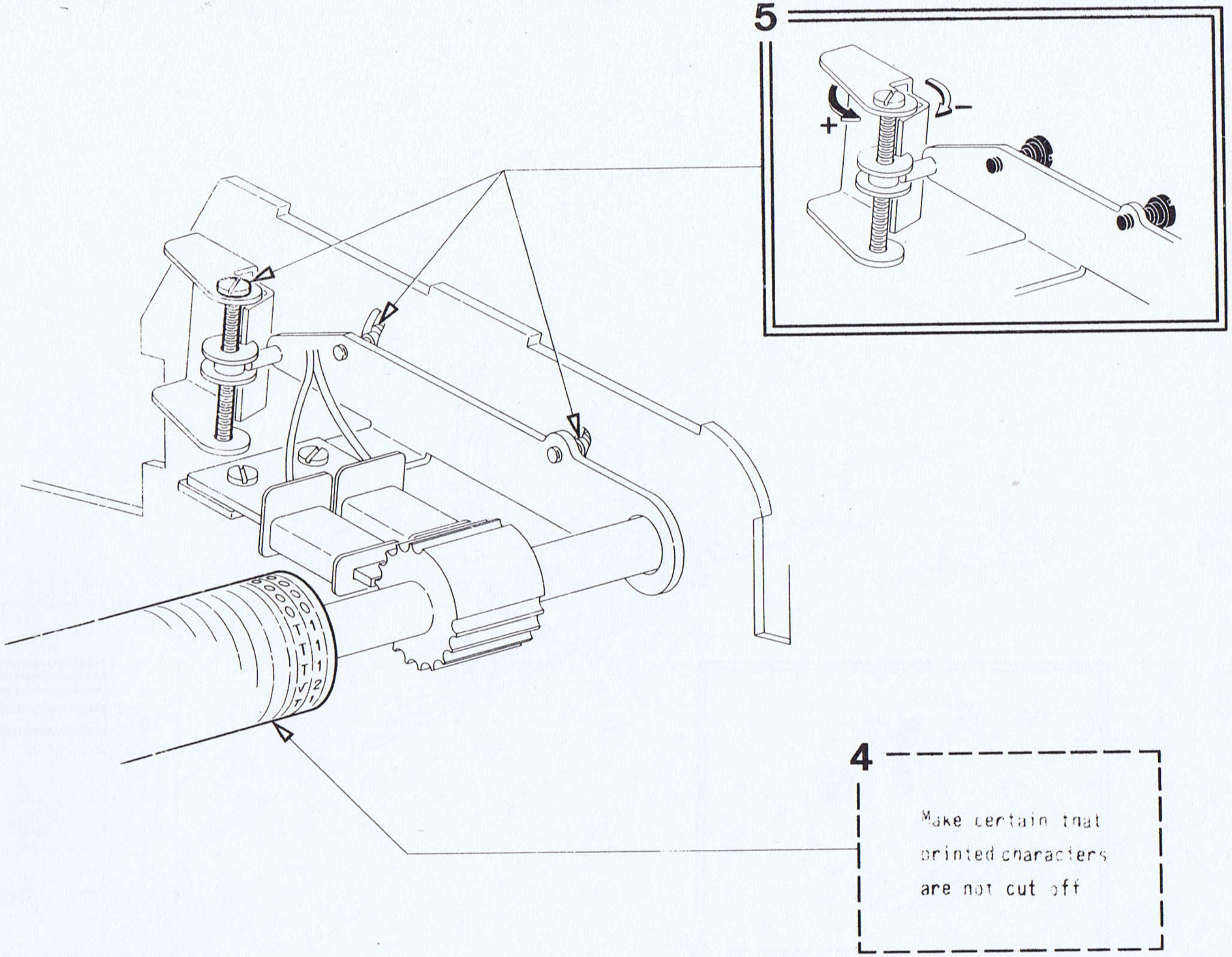


2

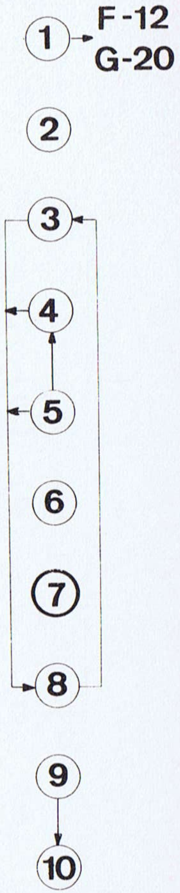


3





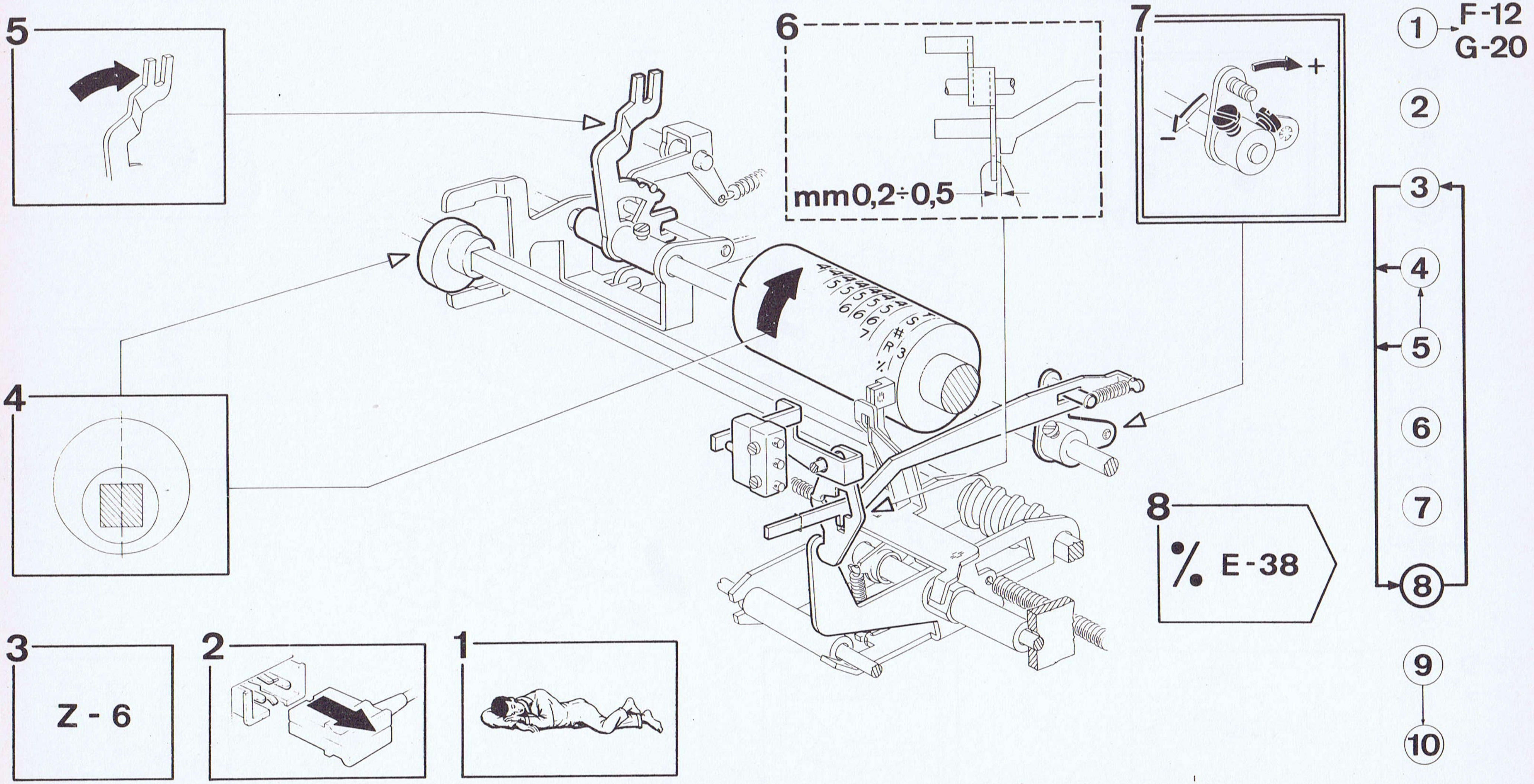
Make certain that printed characters are not cut off



NOTE: Move in the direction (+) if the characters are missing on the bottom.
Move in the direction (-) if the characters are missing on top.

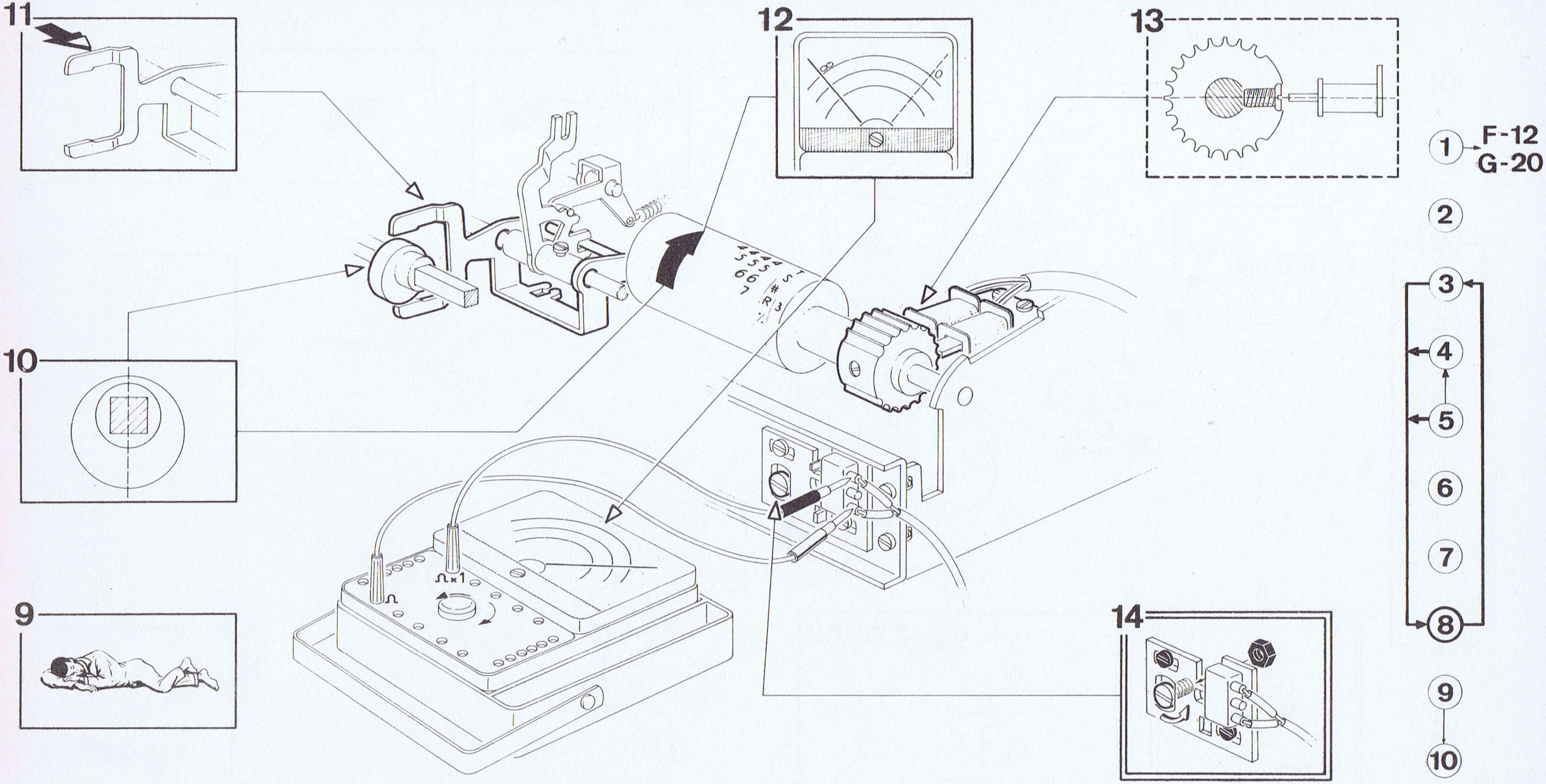
ADJUSTING THE AW MICROSWITCH

At the beginning of each printing phase, the clearance shown on page E-23 (frame 3) must be checked. At the departure of the carriage, the conditions illustrated on page E-20 (frame 2) must be achieved.



(Z-6, Paper cutter removal)

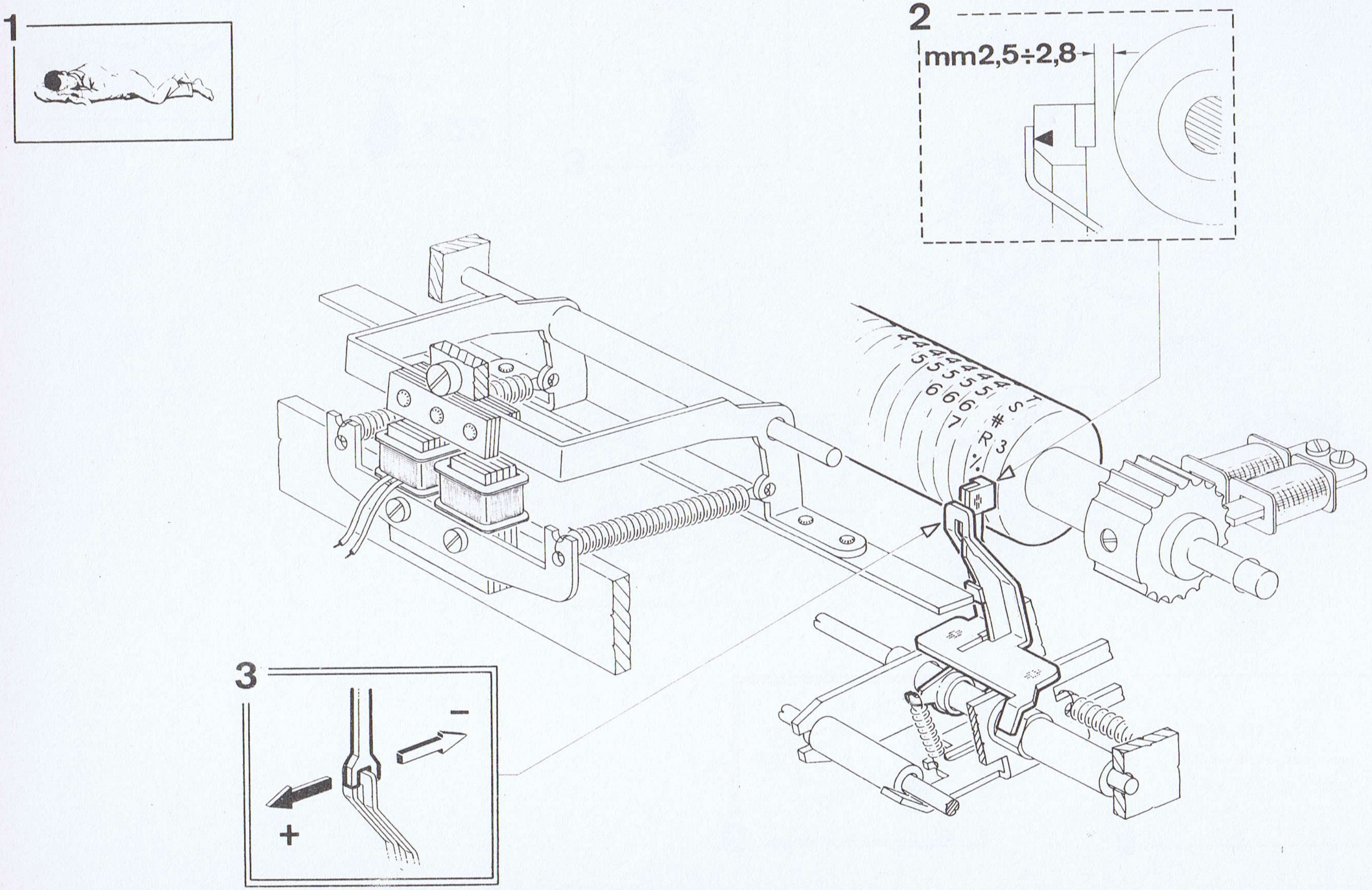
ADJUSTING THA AW MICROSWITCH (continuation)

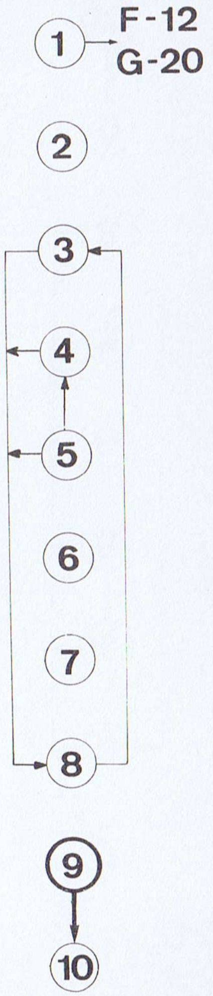


NOTE: Prior to taking a meter reading, it is advisable to scratch a notch in each AW Microswitch contact so that probes will not slip off contacts.

ADJUST THE REST POSITION OF THE FIRE HAMMER

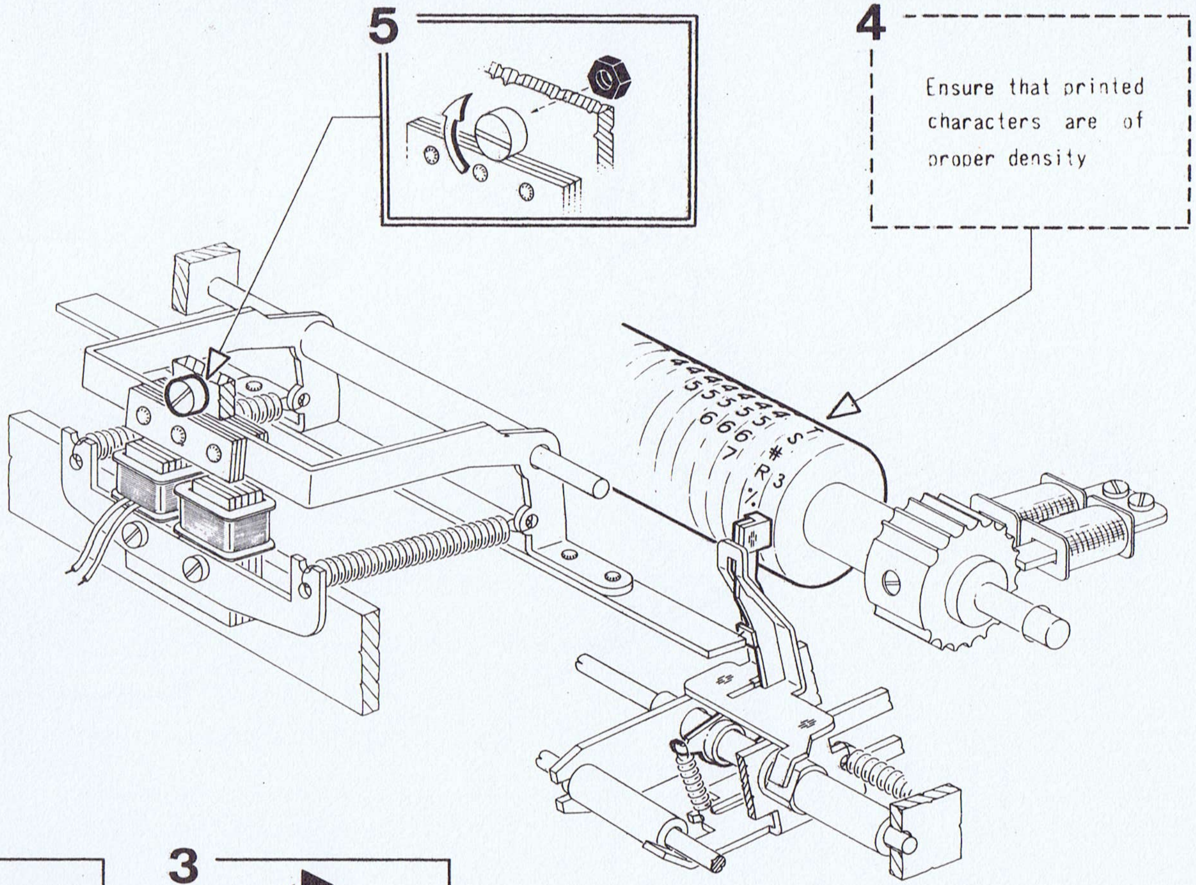
At rest, the Hammer must be away from the character drum.



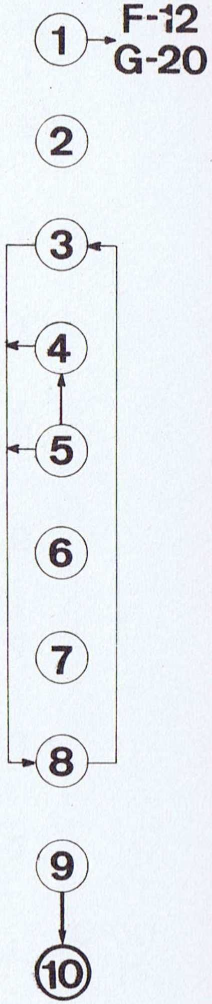


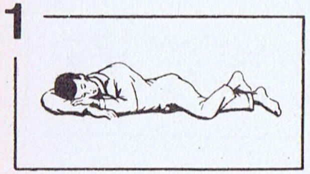
ADJUSTING THE STRIKING POWER OF THE FIRE HAMMER

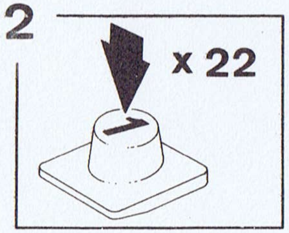
The printed characters must be clear.

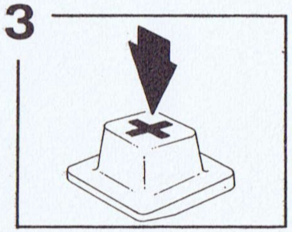


Ensure that printed characters are of proper density





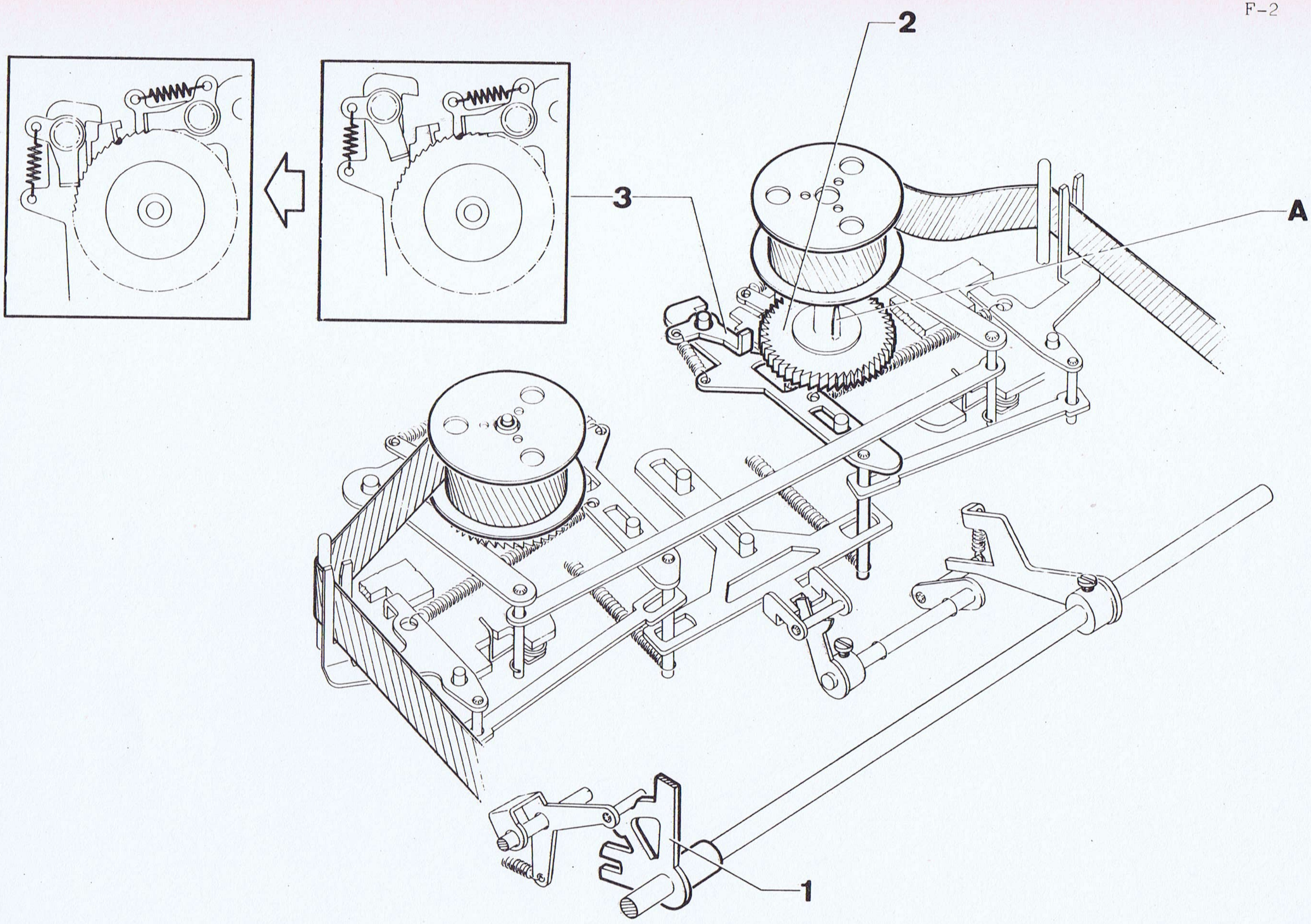




NOTE: It is advisable to repeat the adjustment with other numeral keys before acting.

Section F

RIBBON FEED-RIBBON REVERSE UNIT


A

The ribbon spools are seated on ratchet gears and held fixed by pin A.

Ribbon feed

The ribbon feeds only at the end of each printing phase. Every time line space controlling lever 1 rotates frontward (= end of the printing phase), a certain amount of ribbon is wound on the dragged spool.

The ribbon feed mechanism is comprised of two feeding devices; one for each spool.

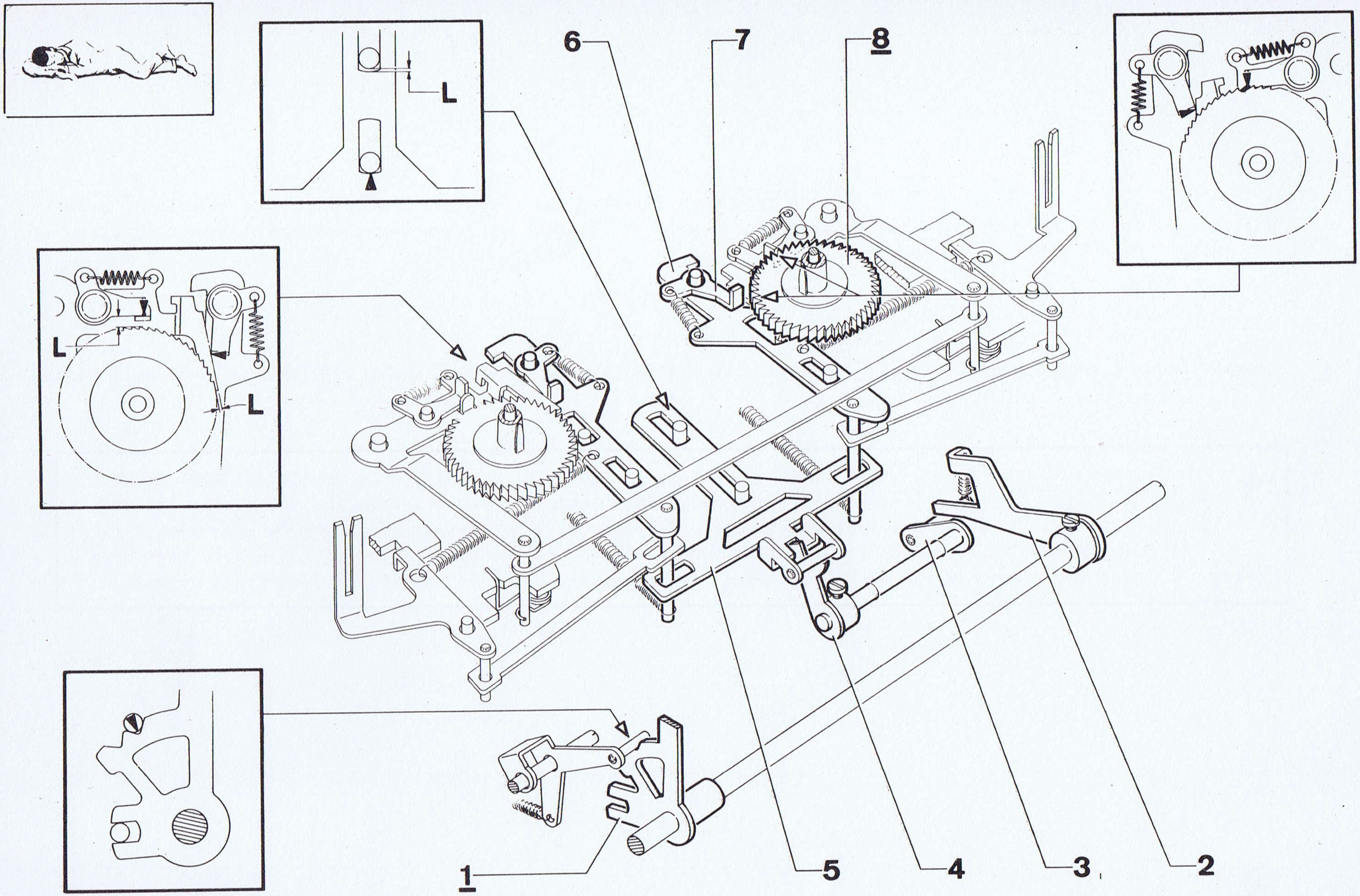
When one device is imparting motion to a spool, the other device is idle.

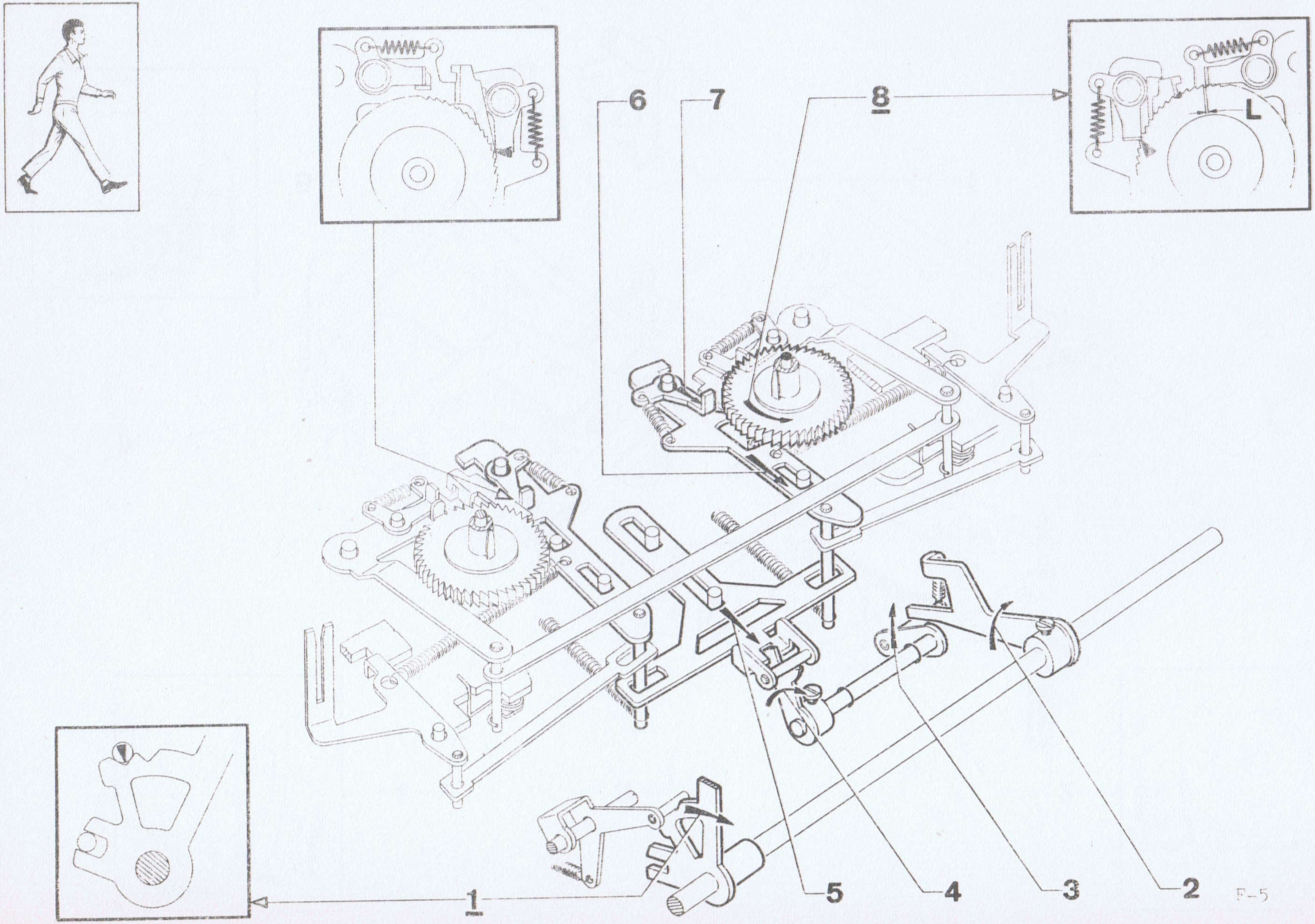
In this case the ribbon is winding on the right spool.

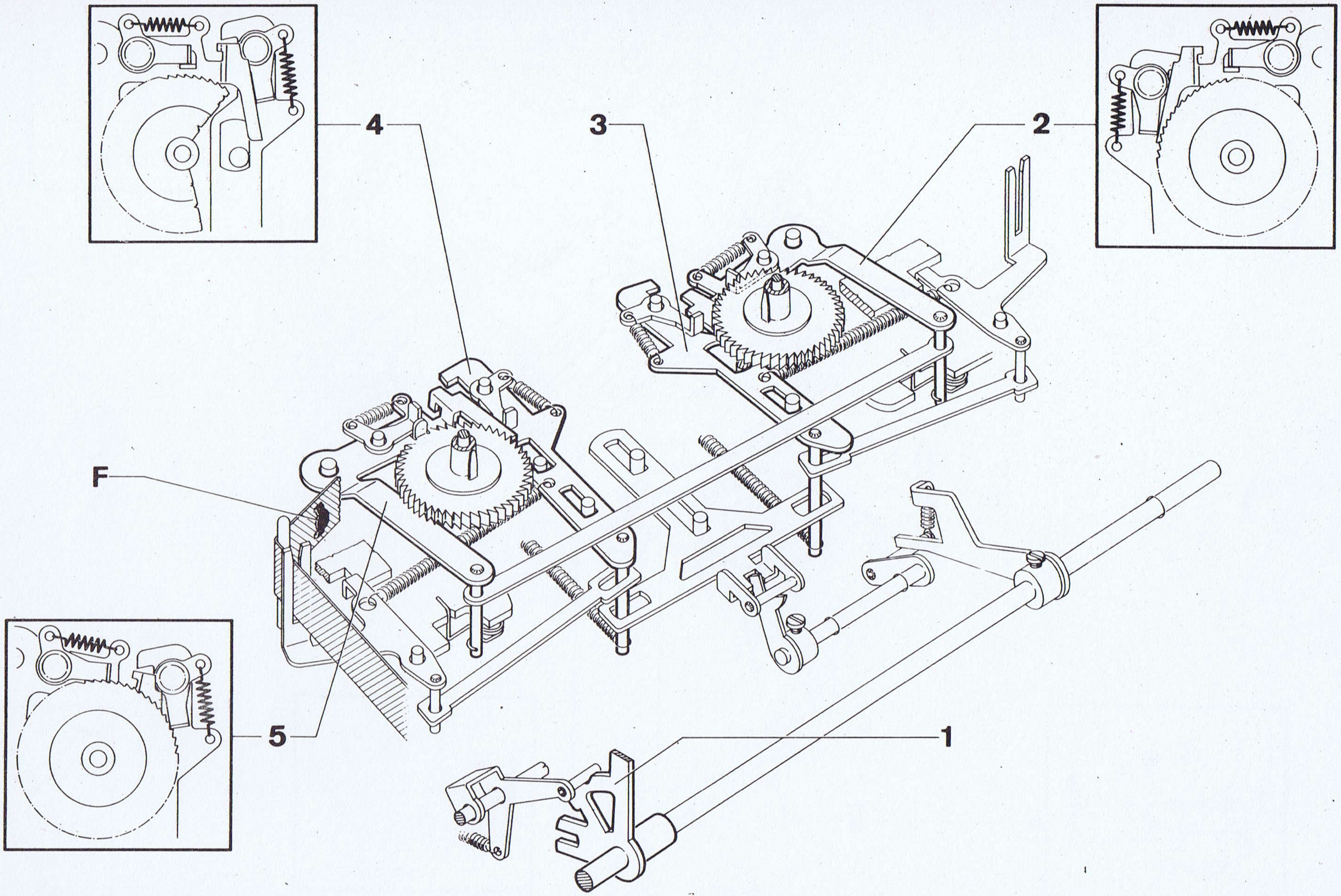
When line space controlling lever 1 rotates frontward, ribbon feed pawl 3 rotates ratchet gear 2 three teeth.

Note:

In the following figures the mechanism is shown while a printing phase is taking place: line space controlling lever 1 has been already rotated rearward (see page E-11 and following).


L
L
L


L


F

Ribbon reverse

When the ribbon has almost completely wound on a spool the device that rotates the other spool is activated and the direction of ribbon feed is reversed.

The two ends of the ribbon are equipped with clip F.

Ribbon reverse is accomplished in two consecutive printing phases, that is, two rearward rotations of line space controlling lever 1.

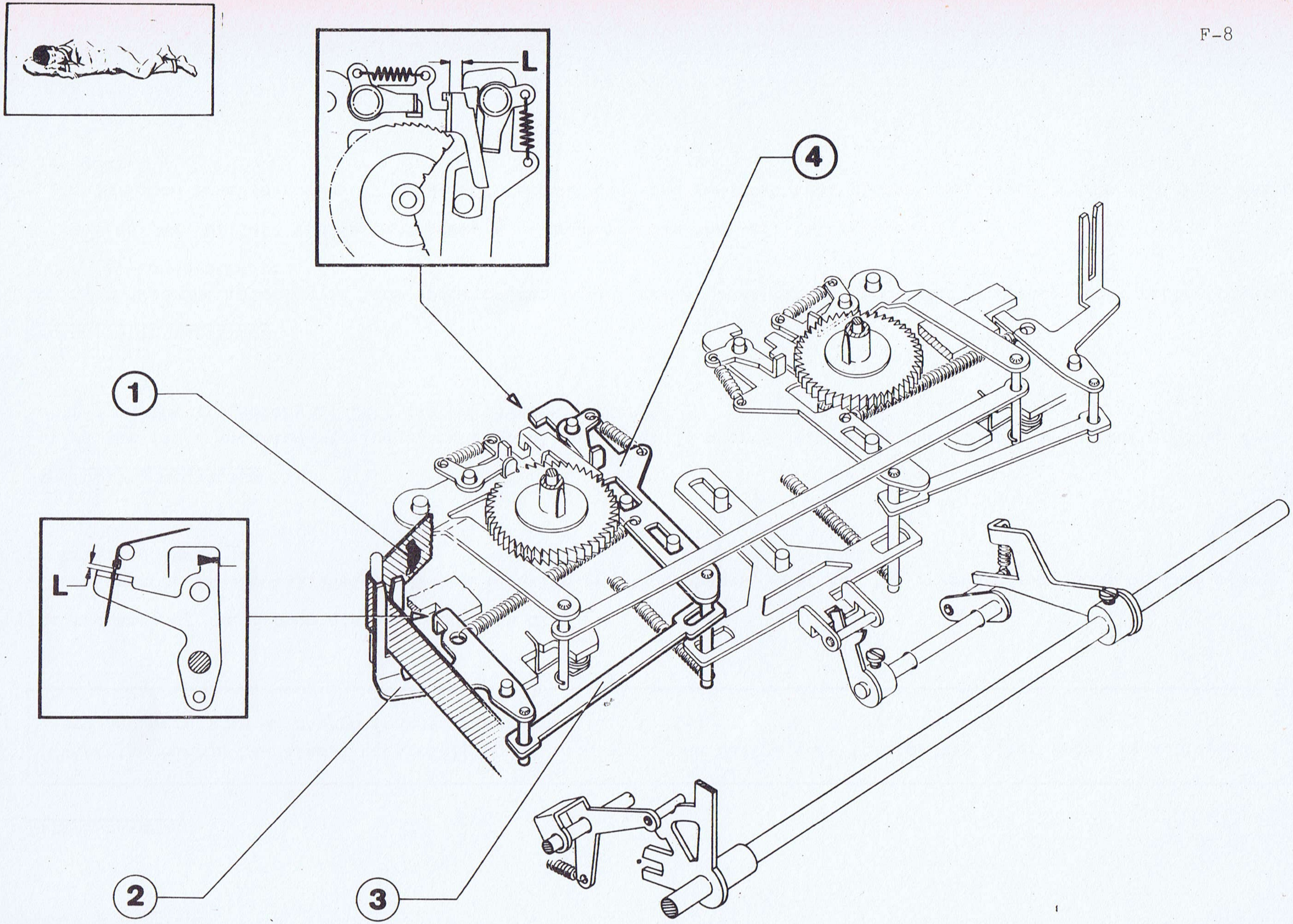
Controlling mechanism

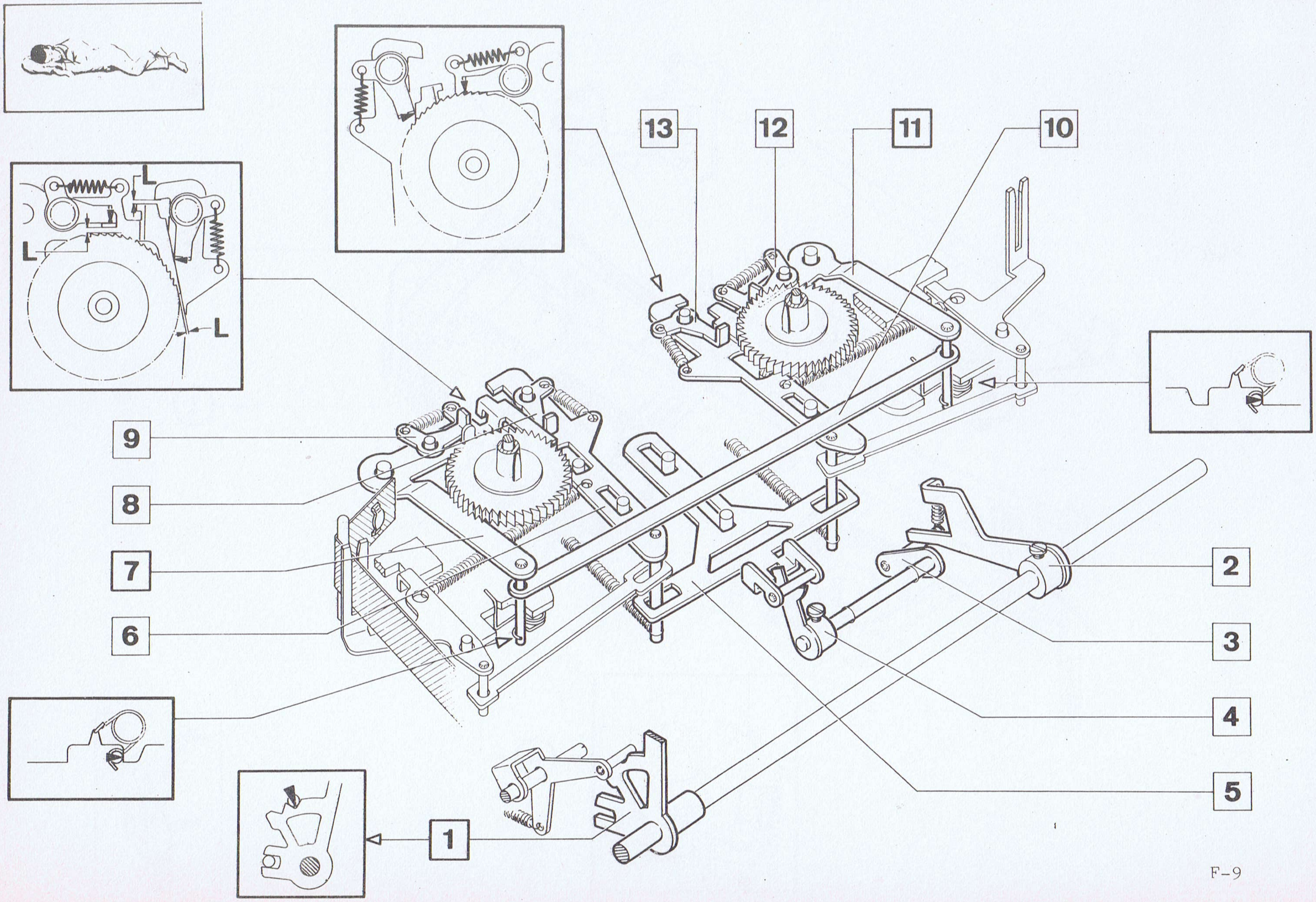
During the first rotation of line space controlling lever 1, clip F, driven by the ribbon, moves left ribbon feed lever 4 on the trajectory of left ribbon reverse rocker 5.

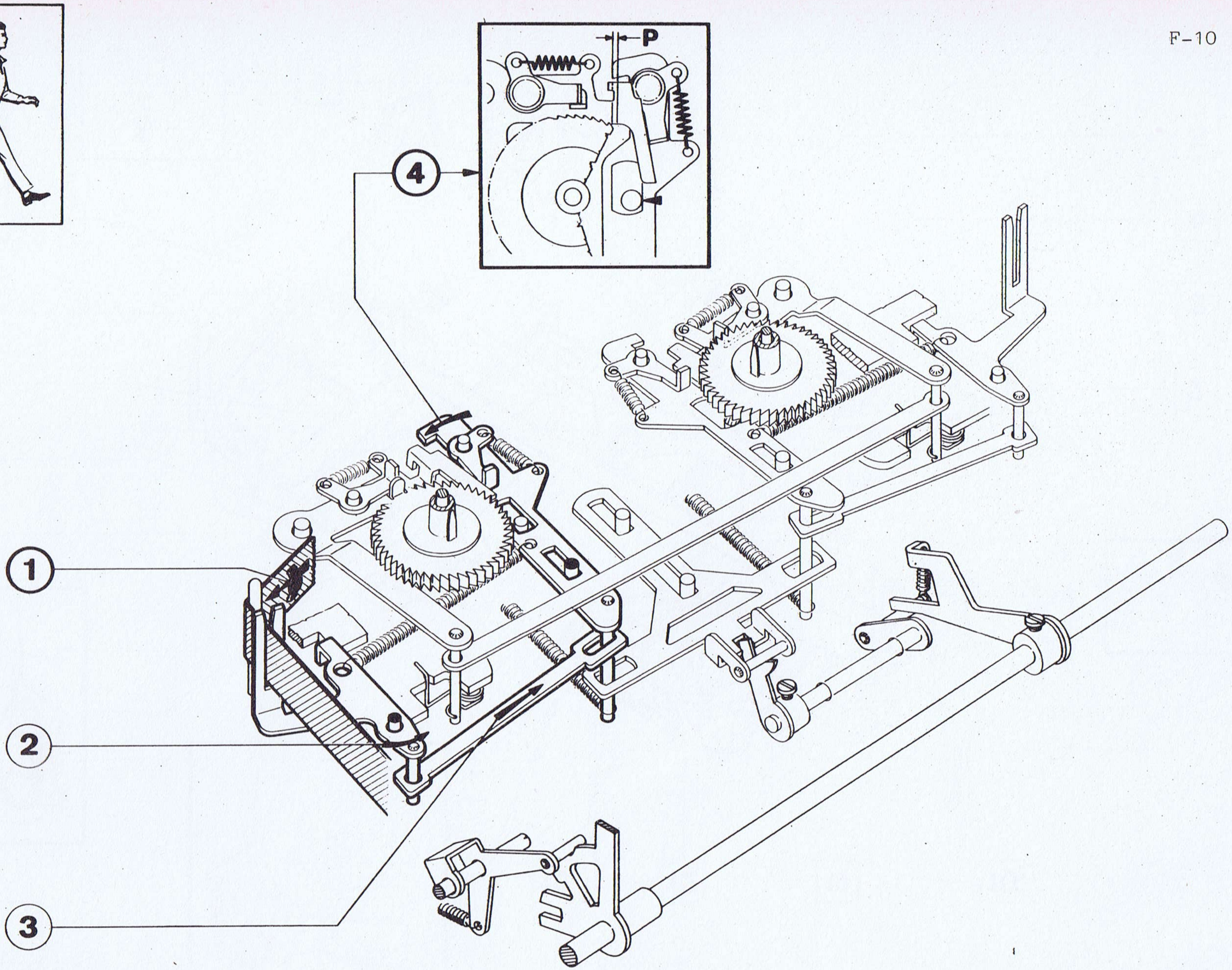
Mechanism of execution

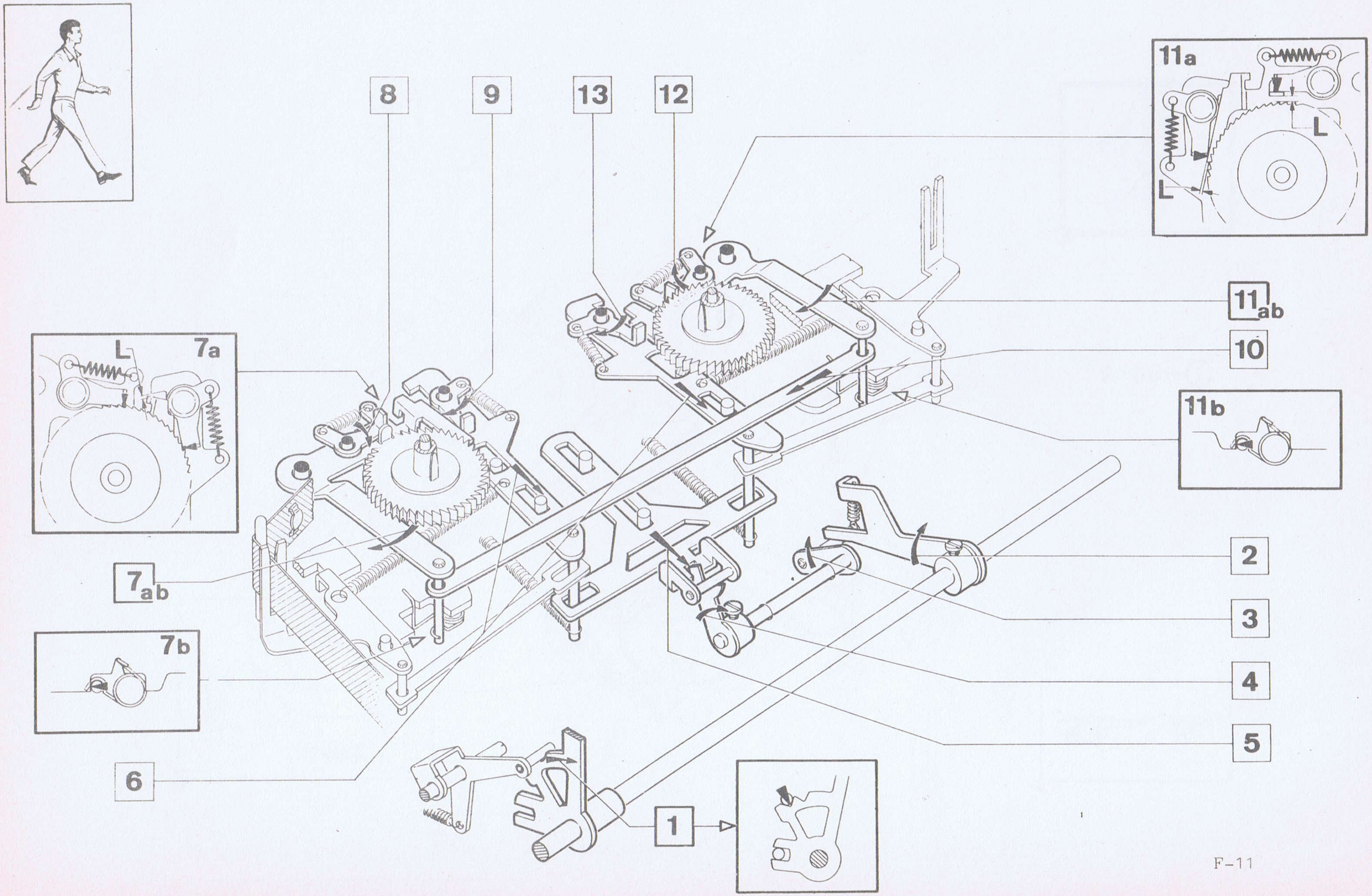
During the second rotation of line space controlling lever 1, left ribbon feed lever 4 rotates left ribbon reverse rocker 5. Consequently:

- the feed pawl of left ribbon feed lever 4 is engaged with the left ratchet gear
- right ribbon reverse rocker 2, rotating, removes the feed pawl of right ribbon feed lever 3 from the right ratchet gear.


L
④
①
L
②
③

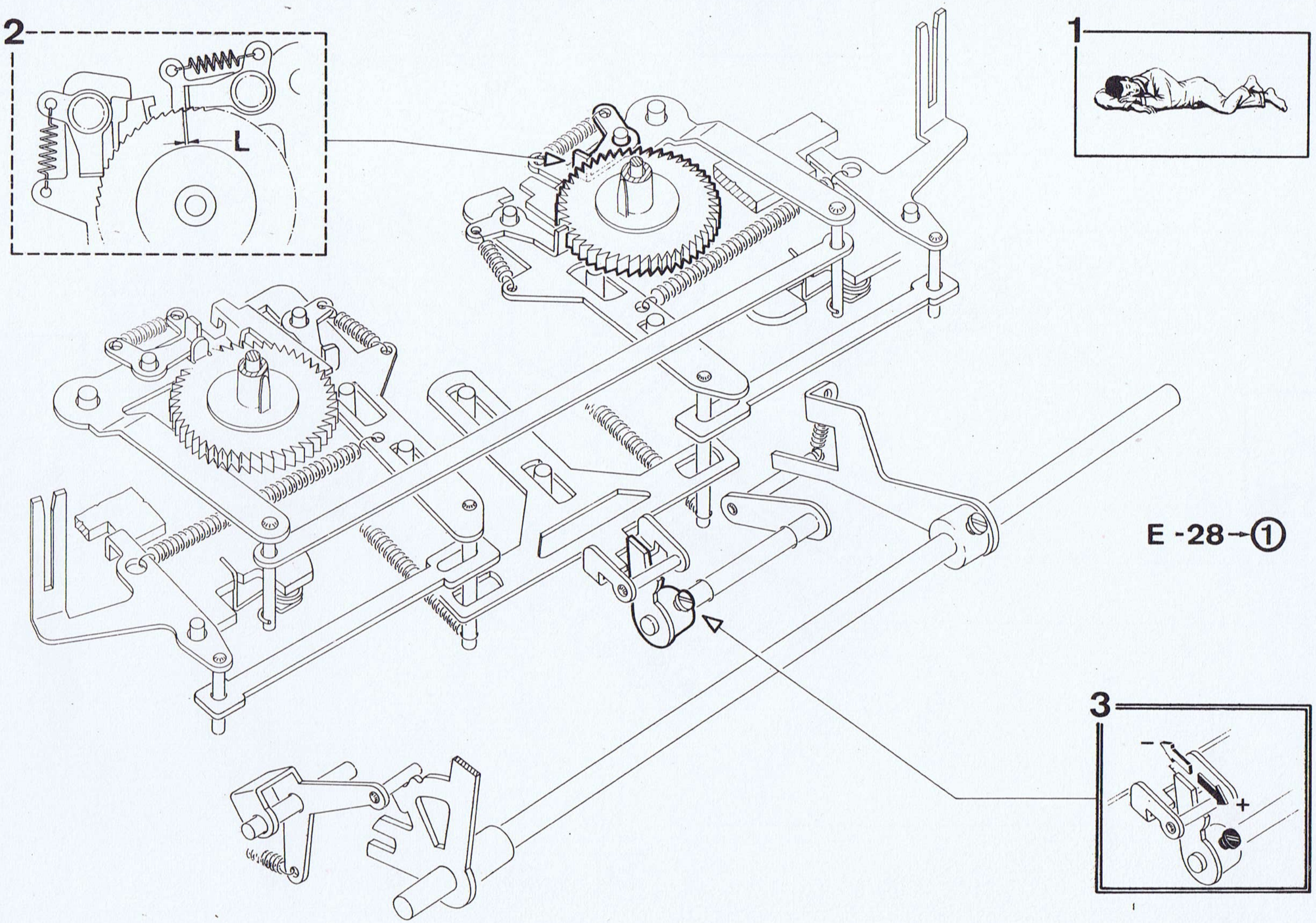

L
L
L


P

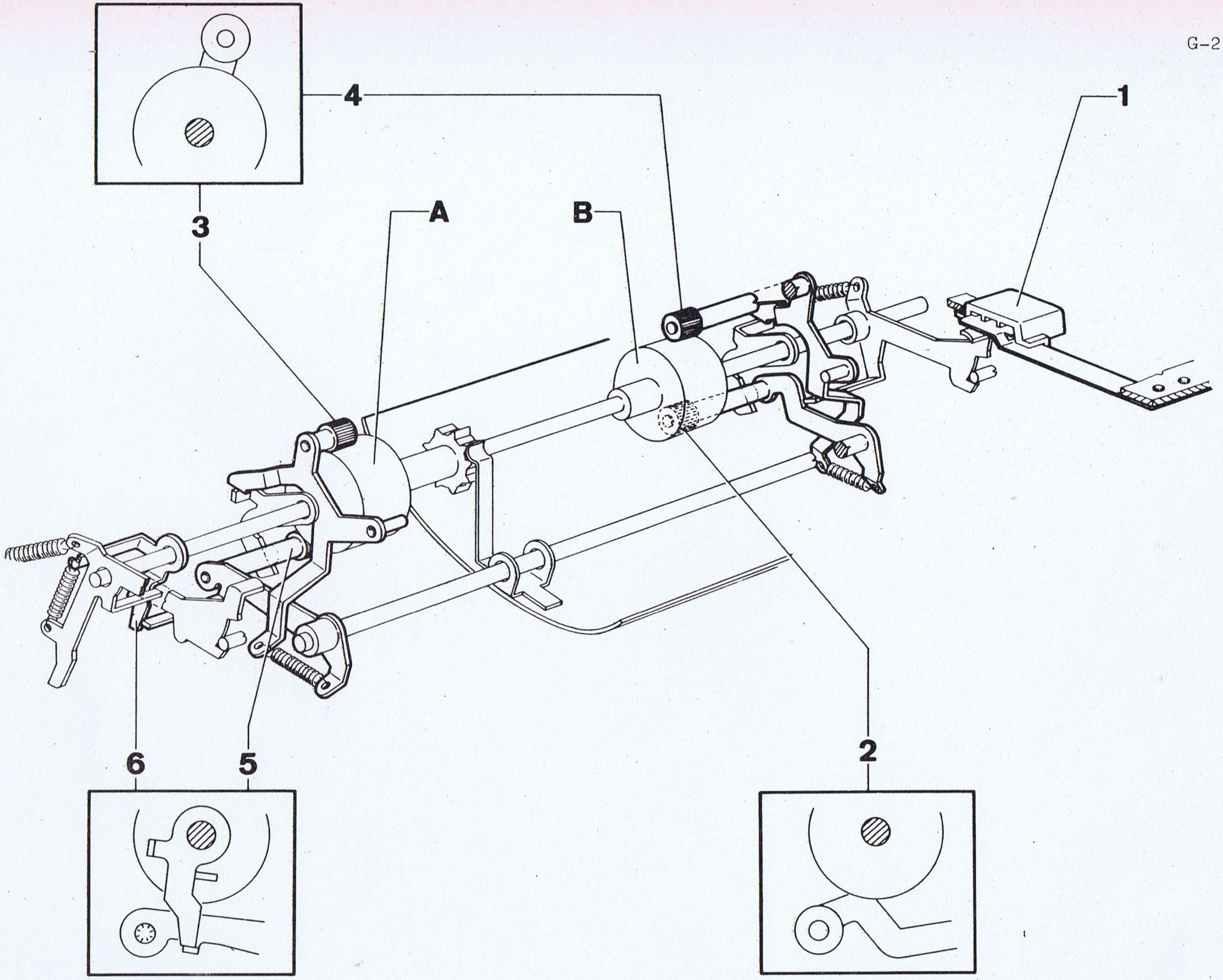

L
L
11ab
7a
L
7ab
7b

ADJUSTING THE AMOUNT OF RIBBON FEED

At the end of each printing phase, the condition illustrated on page F-5 (frame 8) must be achieved.



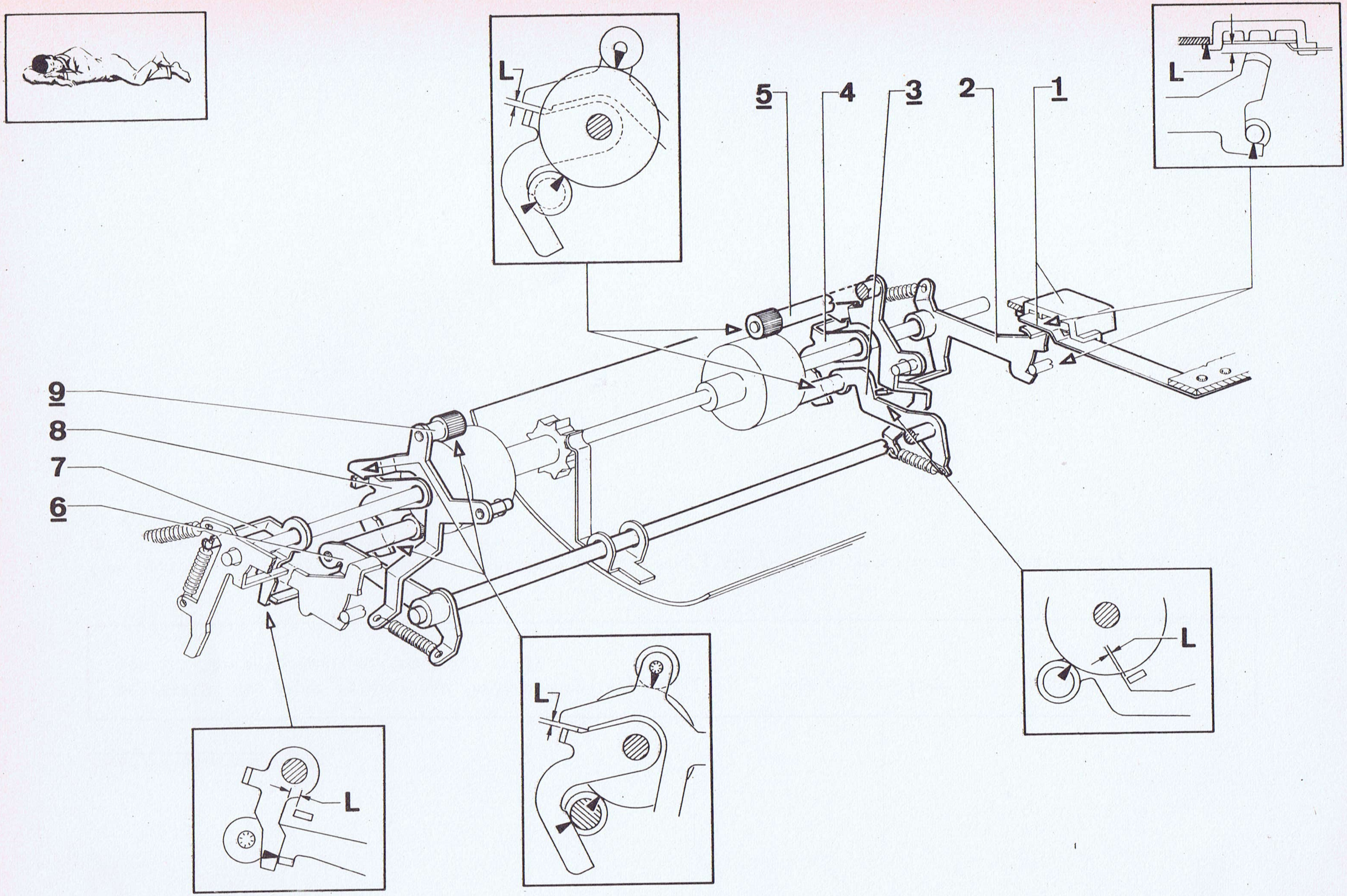
Section G
PAPER FEED UNIT

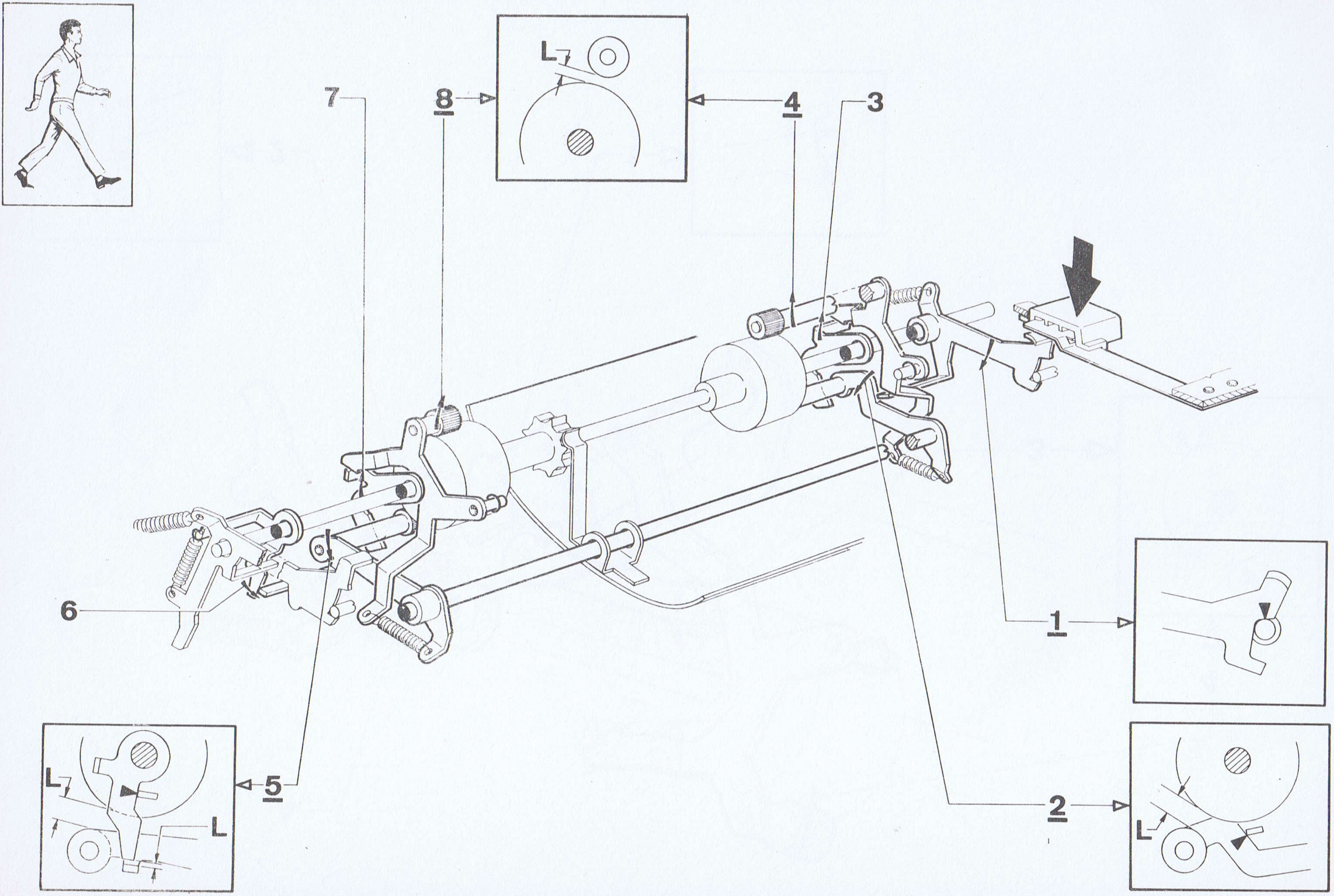

A
B

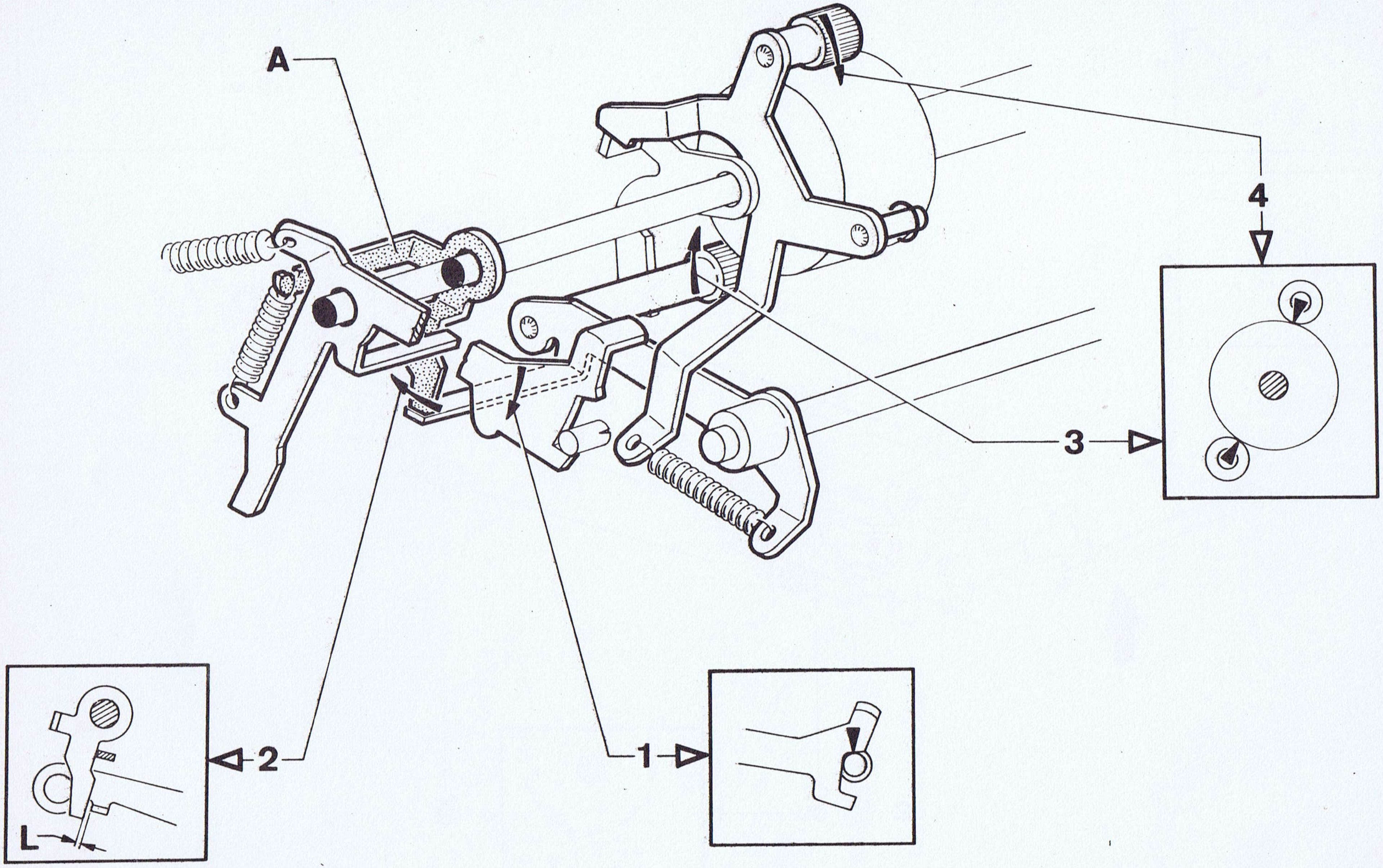
Paper release mechanism

Depressing the paper release key, pressure rollers 2, 3, 4, 5, are removed from their rubber rollers to allow for the settlement of the tally roll.

When paper release key 1 is depressed, rollers 2, 3, 4 and 5 are removed from rubber rollers A and B and kept in this position by detent 6.


L
L
L
L
L


L
L
L
L

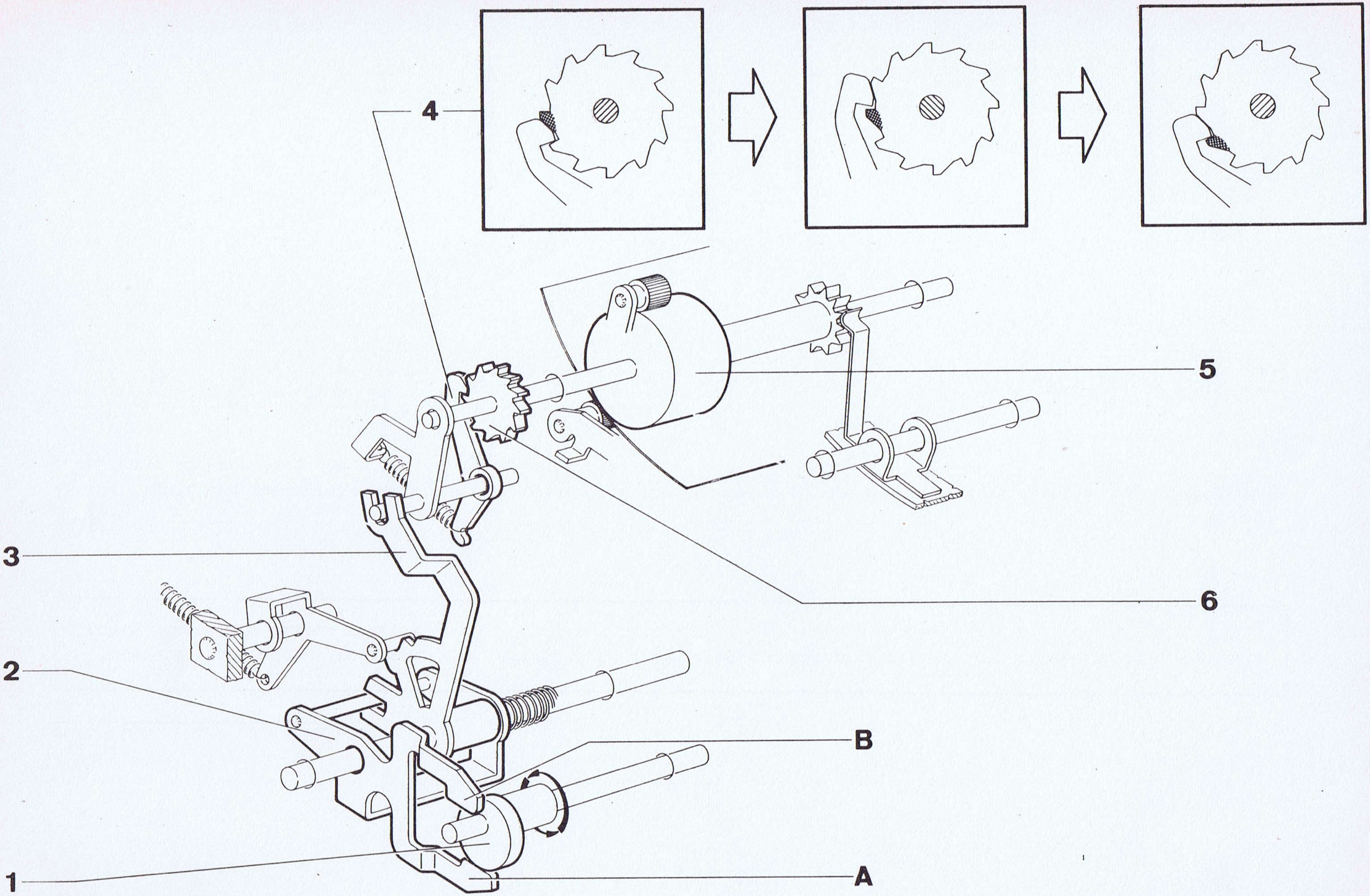

A
L

Unlocking of the paper release

Depressing the manual line space key, detent A is disengaged and the pressure rollers return to rest against their respective rubber rollers.

Note:

In the figure are shown only the movements related to the unlocking of the paper release since all the other conditions have already been shown in the preceding topic.


B
A

Automatic line space

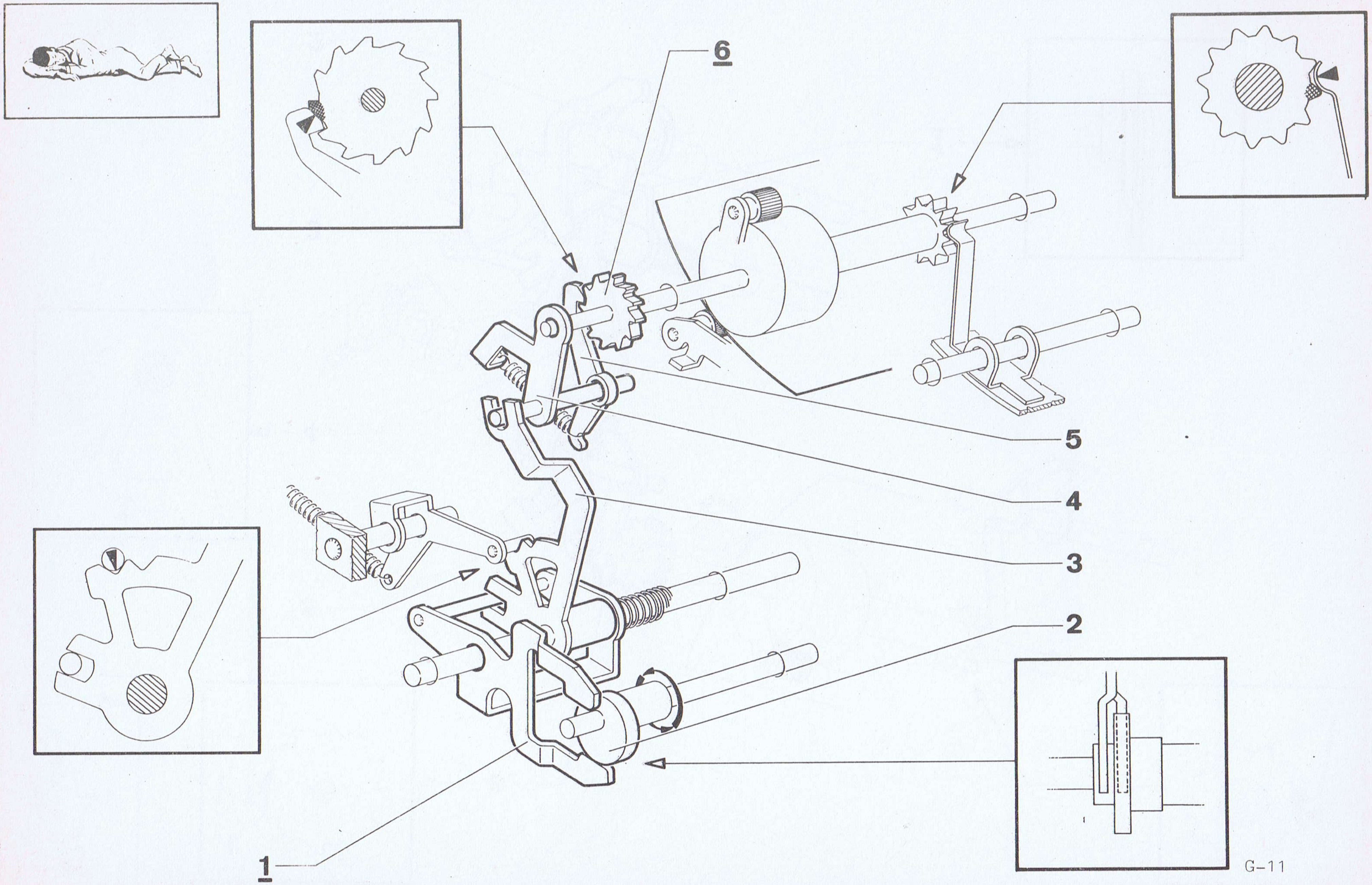
At the end of every printing phase, the tape is advanced a certain amount to allow the printing of a new line of characters.

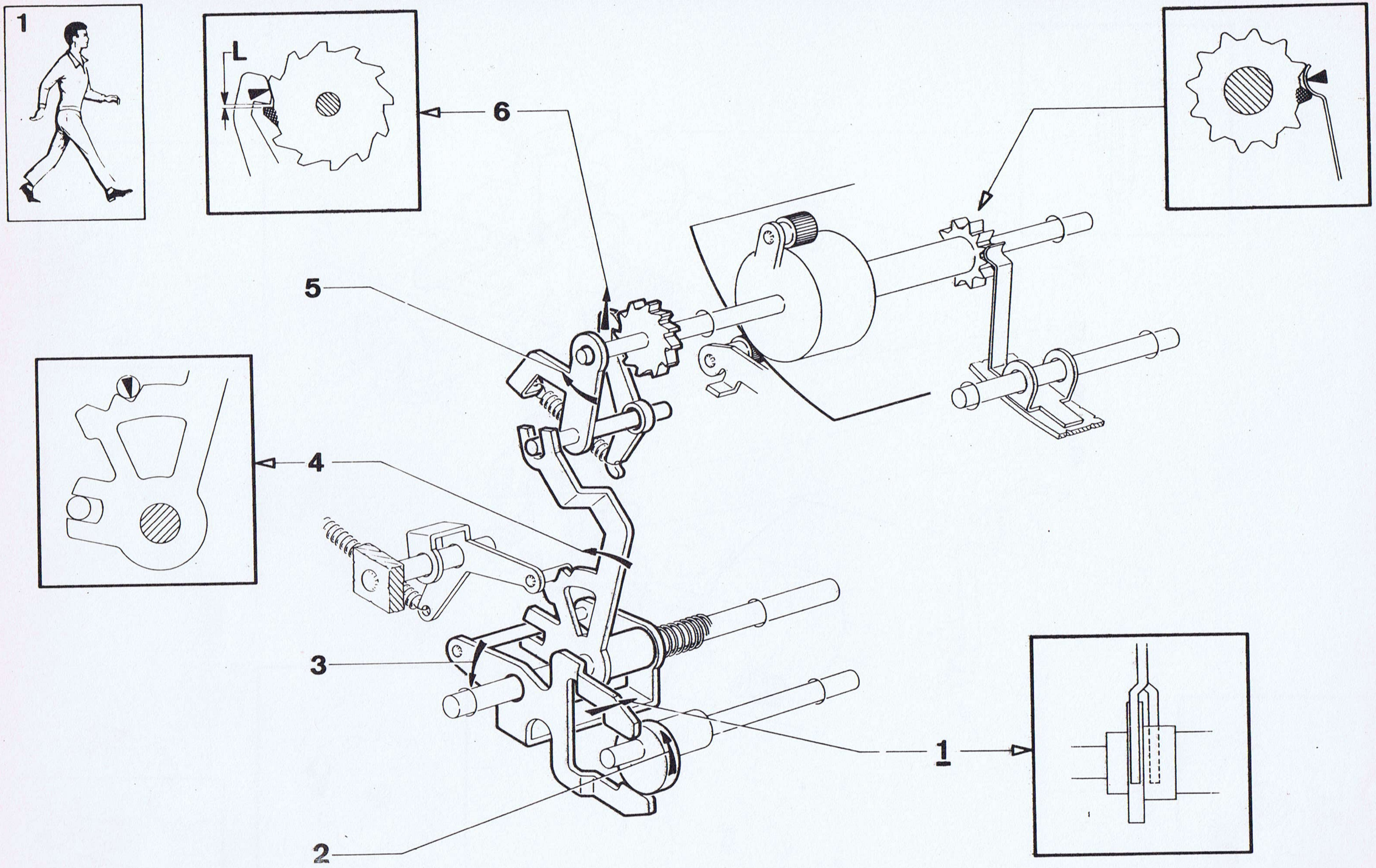
Every printing phase is characterized, as already seen on pages E-12 to E-17, by an oscillation of line space controlling lever 3:

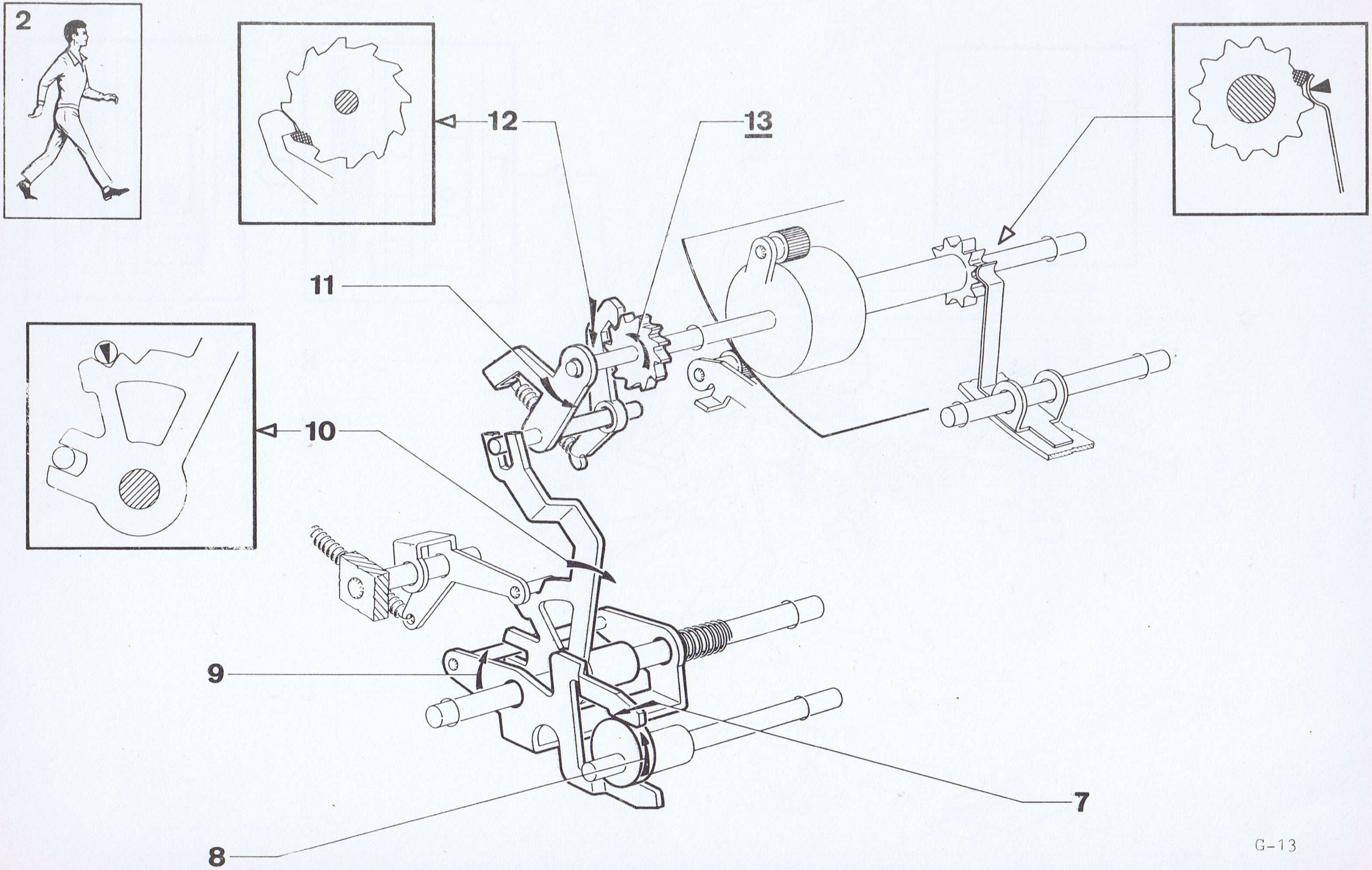
- at the beginning of the printing phase, carriage engagement controlling bridge 2 moves arm B on the trajectory of print cam 1 which causes a rearward rotation of line space controlling lever 3.
- at the end of the printing phase, carriage engagement controlling bridge 2 moves arm A on the trajectory of print cam 1 which causes the front return of line space controlling lever 3.

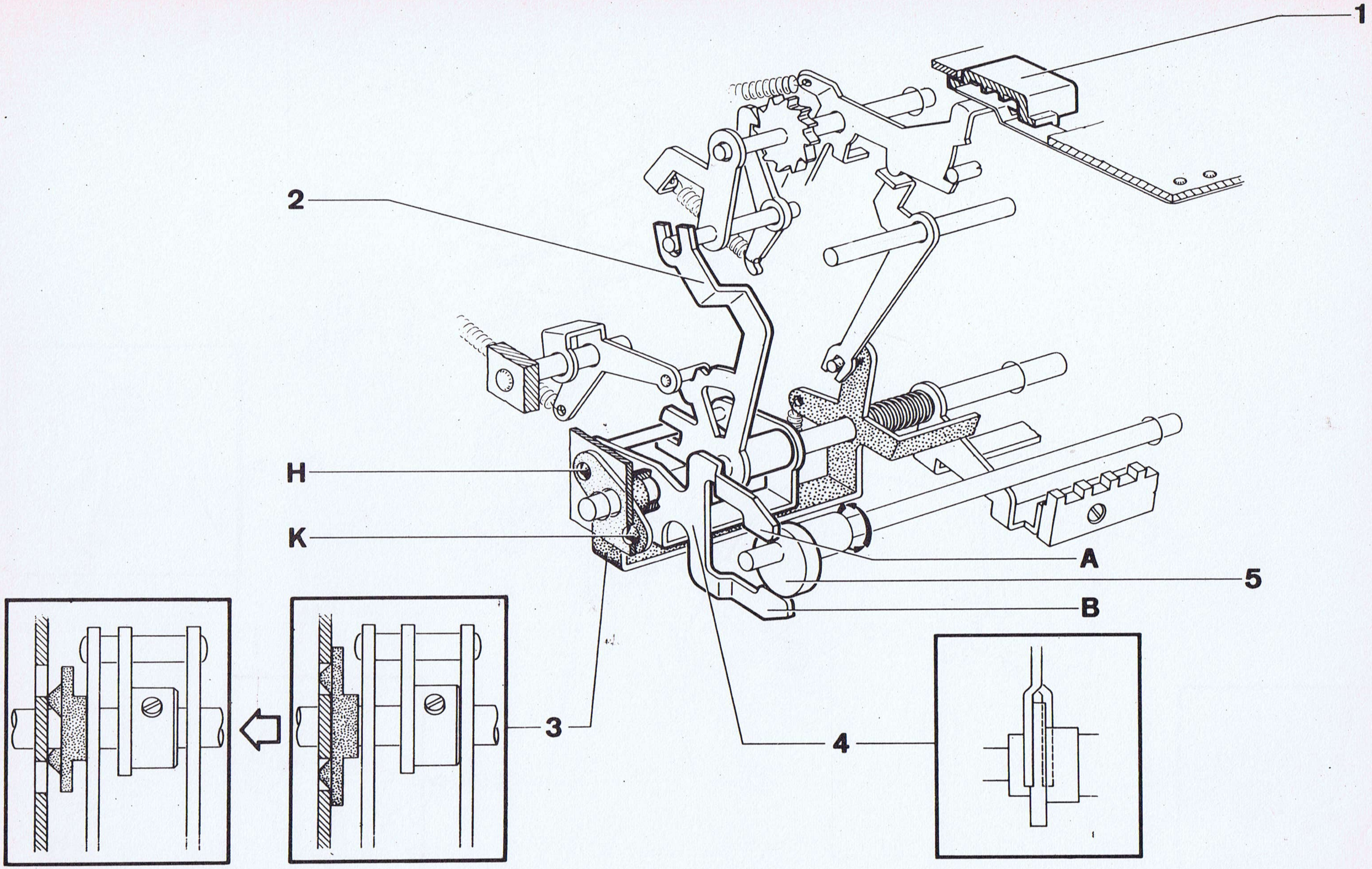
The oscillation of line space controlling lever 3 causes line space feed pawl 4 to rotate one tooth of line space ratchet 6.

The tape is kept in contact, by the pressure rollers, with rubber rollers 5 (left and right) which are mated to line space ratchet 6.




L



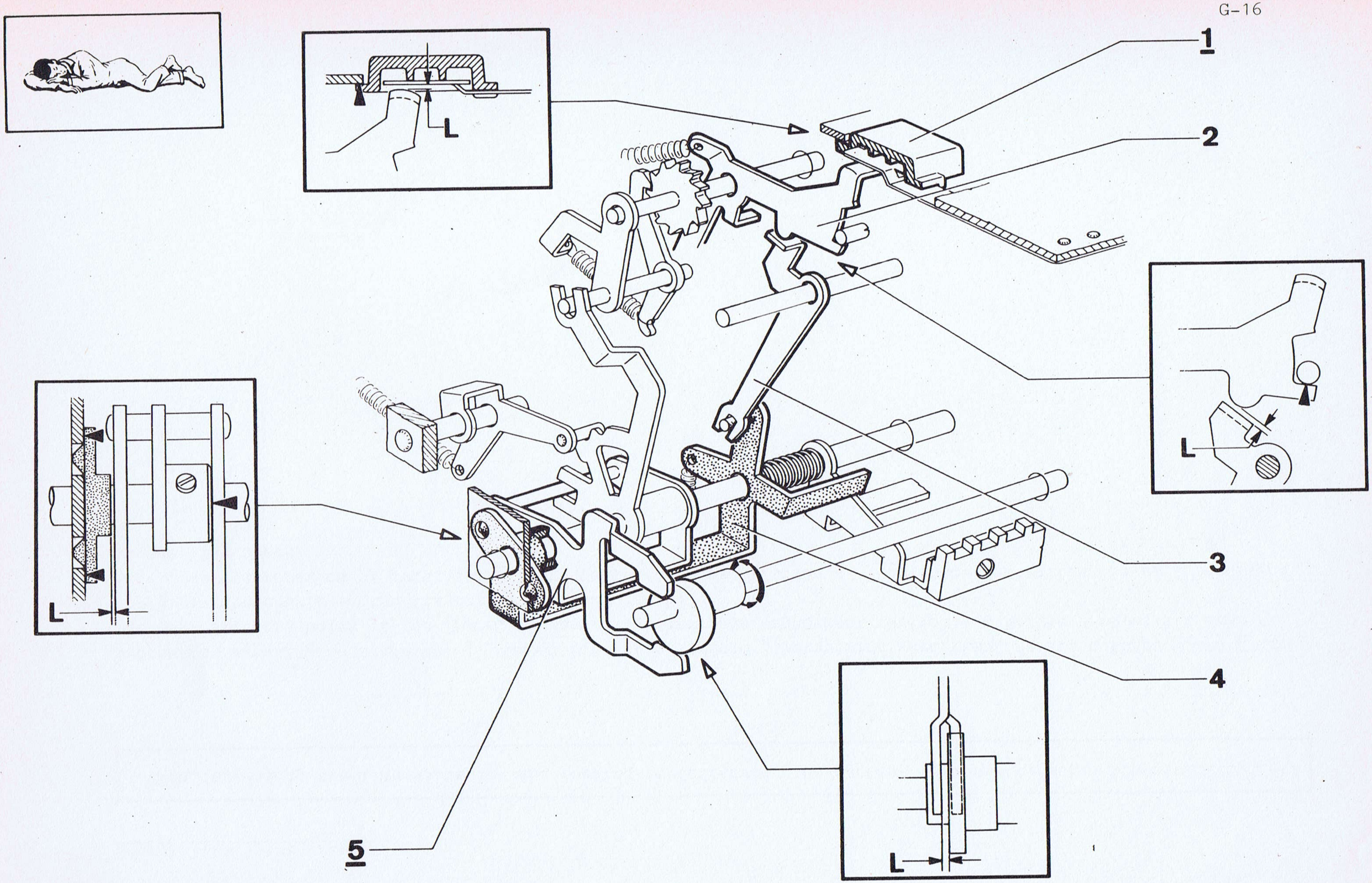

1
2
H
K
A
5
B
3
4

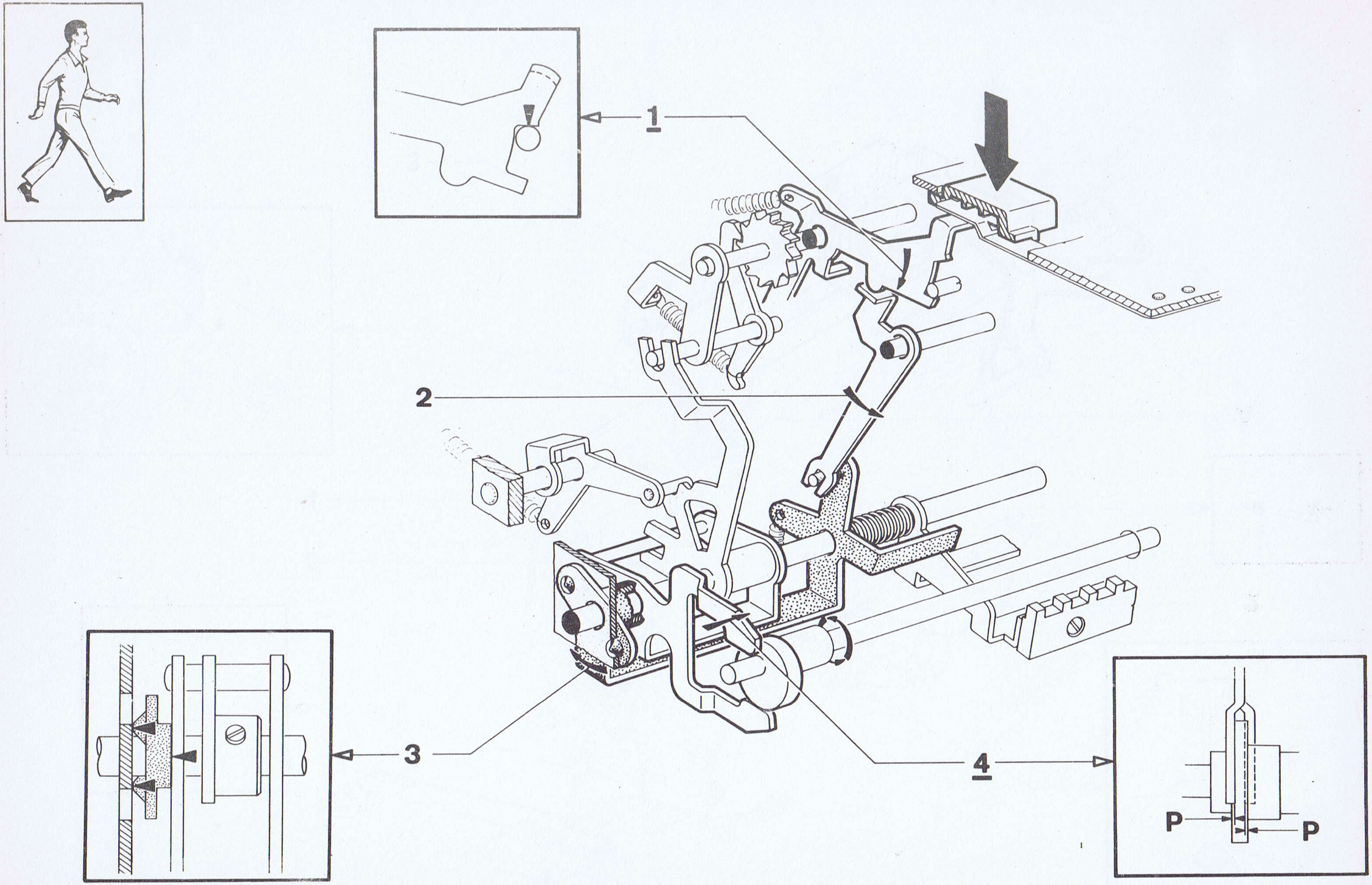
Manual line space (repeat)

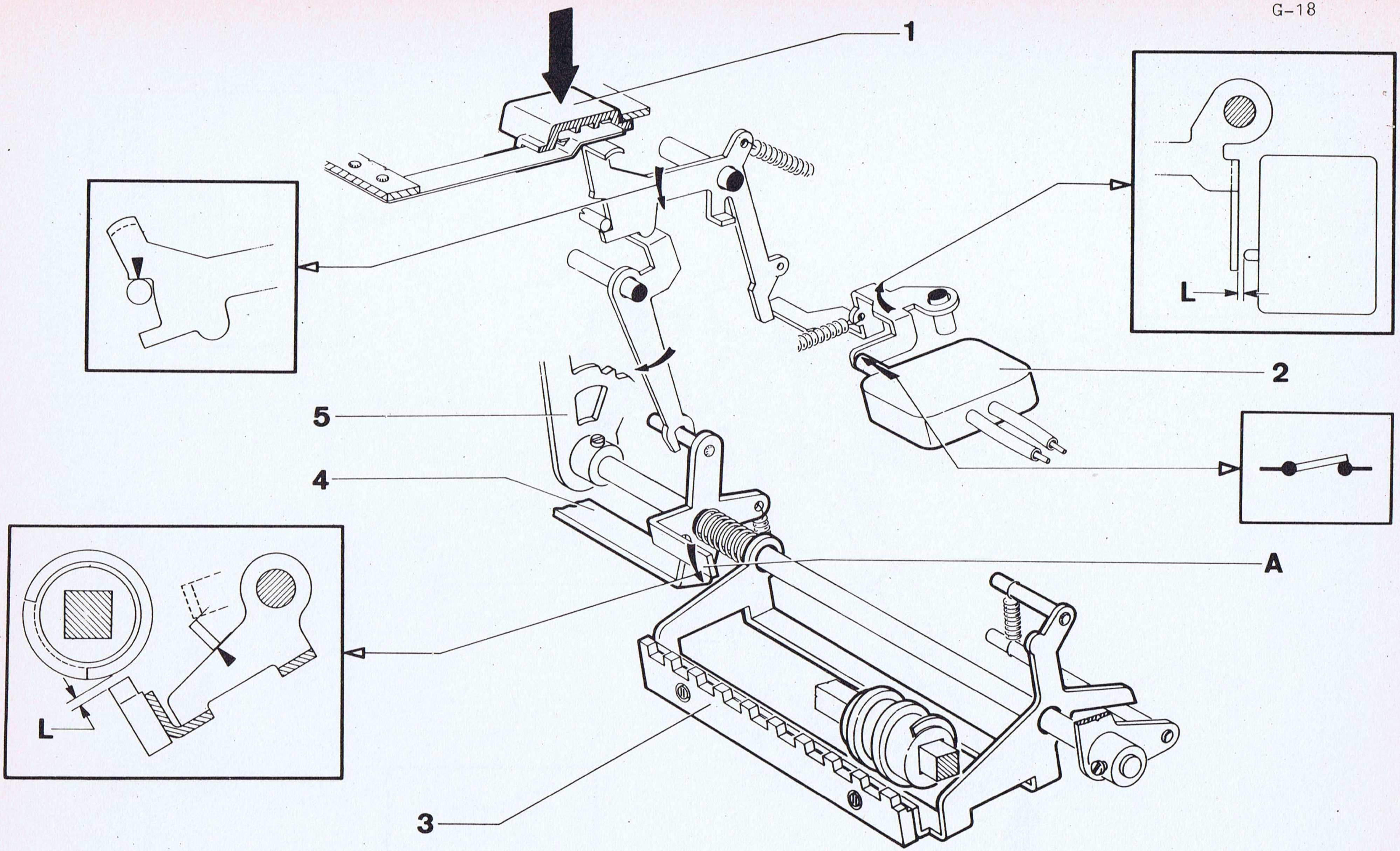
When depressing the line space key and keeping it depressed, the machine performs repeated line space cycles.

Depressing manual line space key 1, manual line space bridge 3 moves rightward removing its bubbles H and K from the corresponding holes in the frame. Consequently, carriage engagement controlling bridge 4 moves its arms A and B simultaneously in the trajectory of print cam 5.

Each complete rotation of print cam 5 corresponds to an oscillation of line space controlling lever 2 resulting in one line space.


1
2
3
4
5
L
L
L
L


P
P


L
A
L

Remarks on manual line space

As has been already mentioned (see page A-3), the motor (normally not operating during the non printing cycles) receives power from manual line space microswitch 2 when the line space key is depressed.

During the manual line space the following conditions could be present:

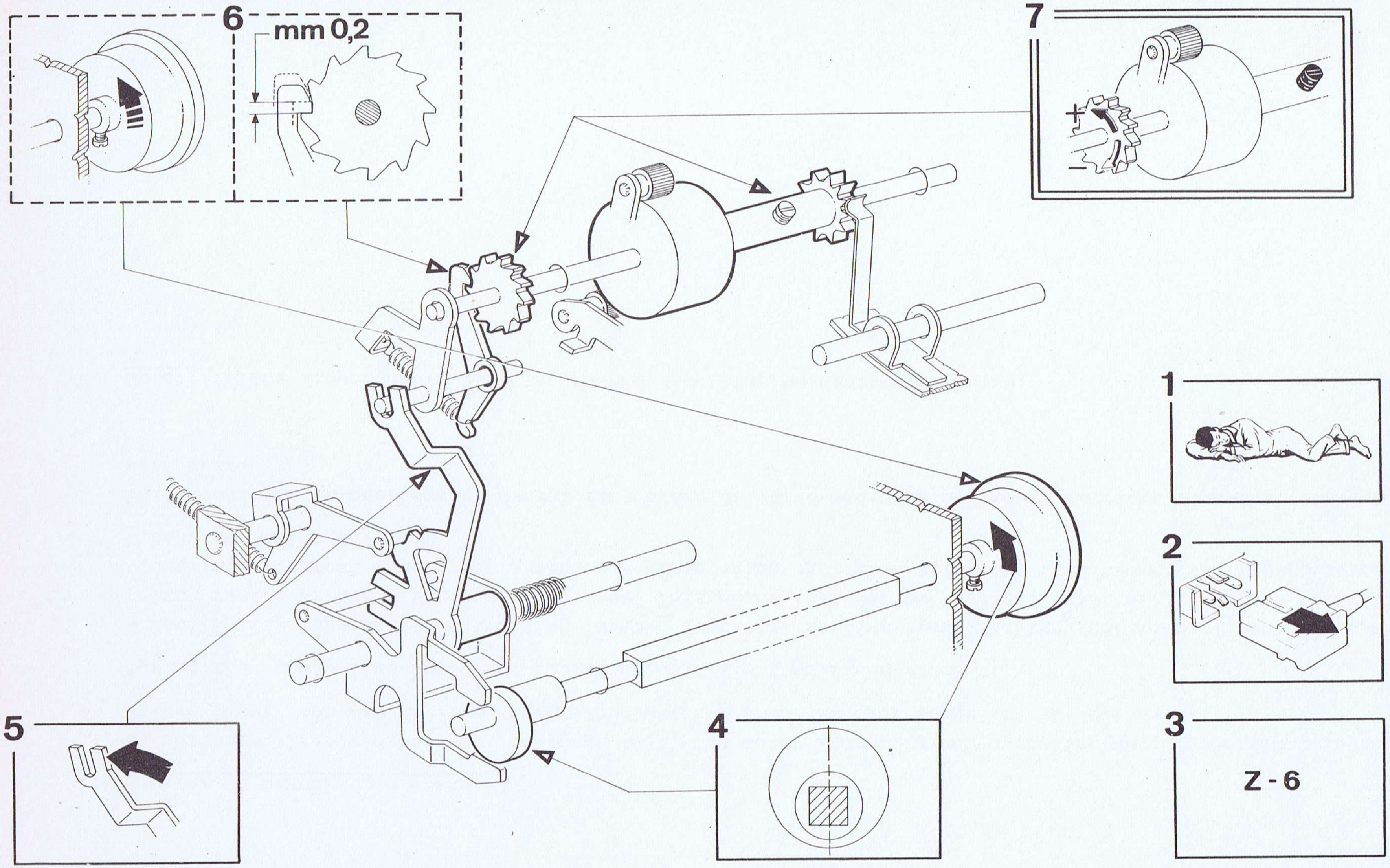
- Oscillating line space controlling lever 5 controls the line space; at the same time it controls carriage movement rack 3 of the Fire hammer carriage. This means that for every oscillation of line space controlling lever 5, carriage movement rack 3 has a tendency of engaging and disengaging the Fire hammer carriage causing an unnecessary and noisy movement.

This condition is overcome by manual line space bridge 4 and wing A keeping carriage movement rack 3 away from the worm gear.

Note: In the figure above only the movements of the mechanism are shown.

ADJUSTING THE AMOUNT OF CONTROL OF THE AUTOMATIC LINE SPACE

At the end of every printing phase, the conditions illustrated on page G-8 (frame 4) must be achieved.

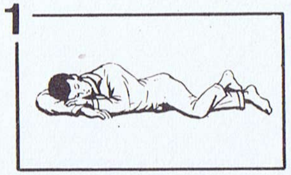


E-28→①

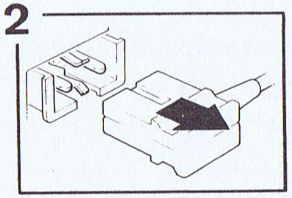
②

③

1



2



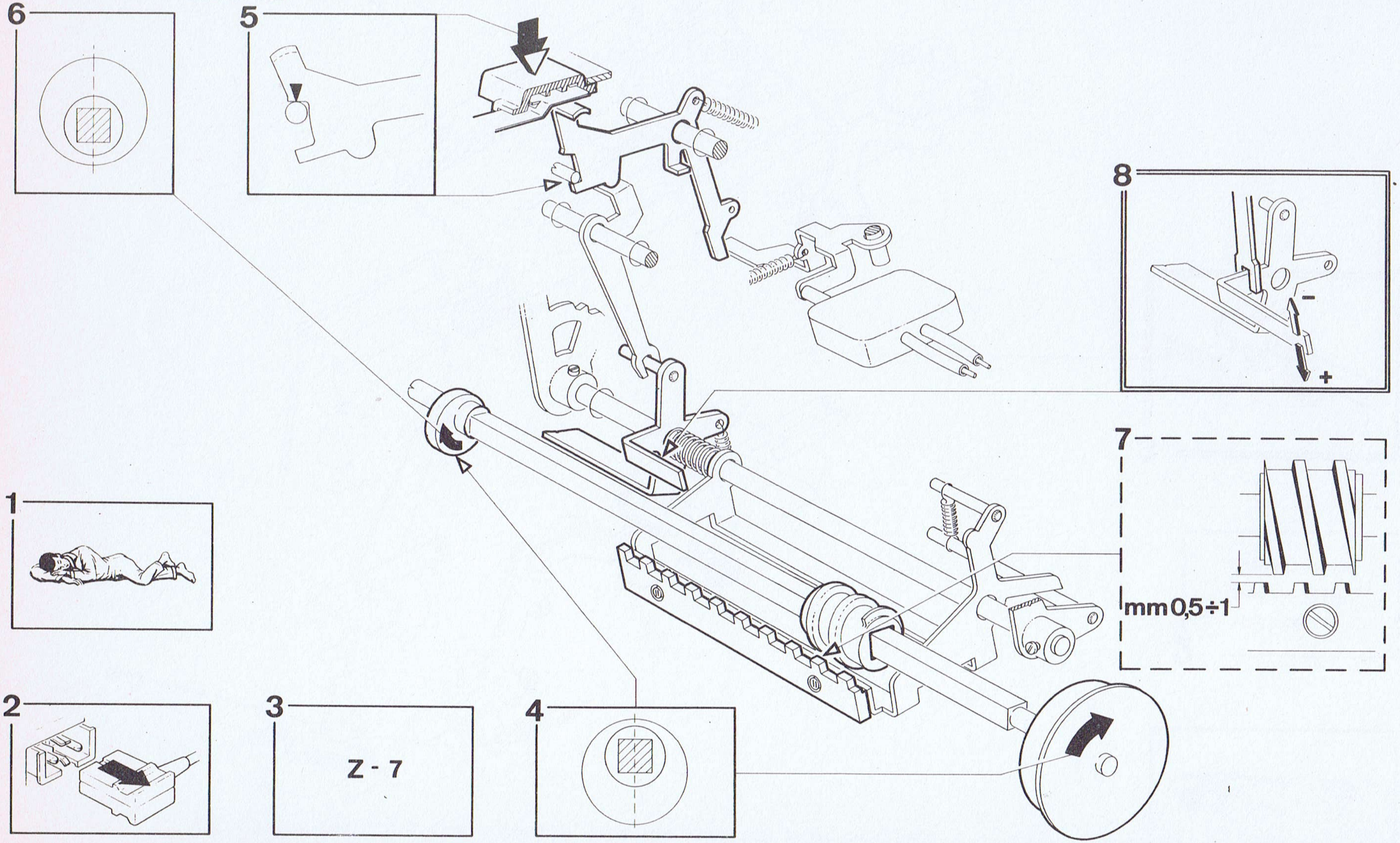
3

Z - 6

(Z-6, Paper cutter removal)

ADJUSTING FOR EXCLUSION OF CARRIAGE MOVEMENT RACK ENGAGEMENT

Depressing the manual line space key, the conditions illustrated on the lower left frame of page G-18 must be achieved.



(Z-7, Removal of the AW plate)

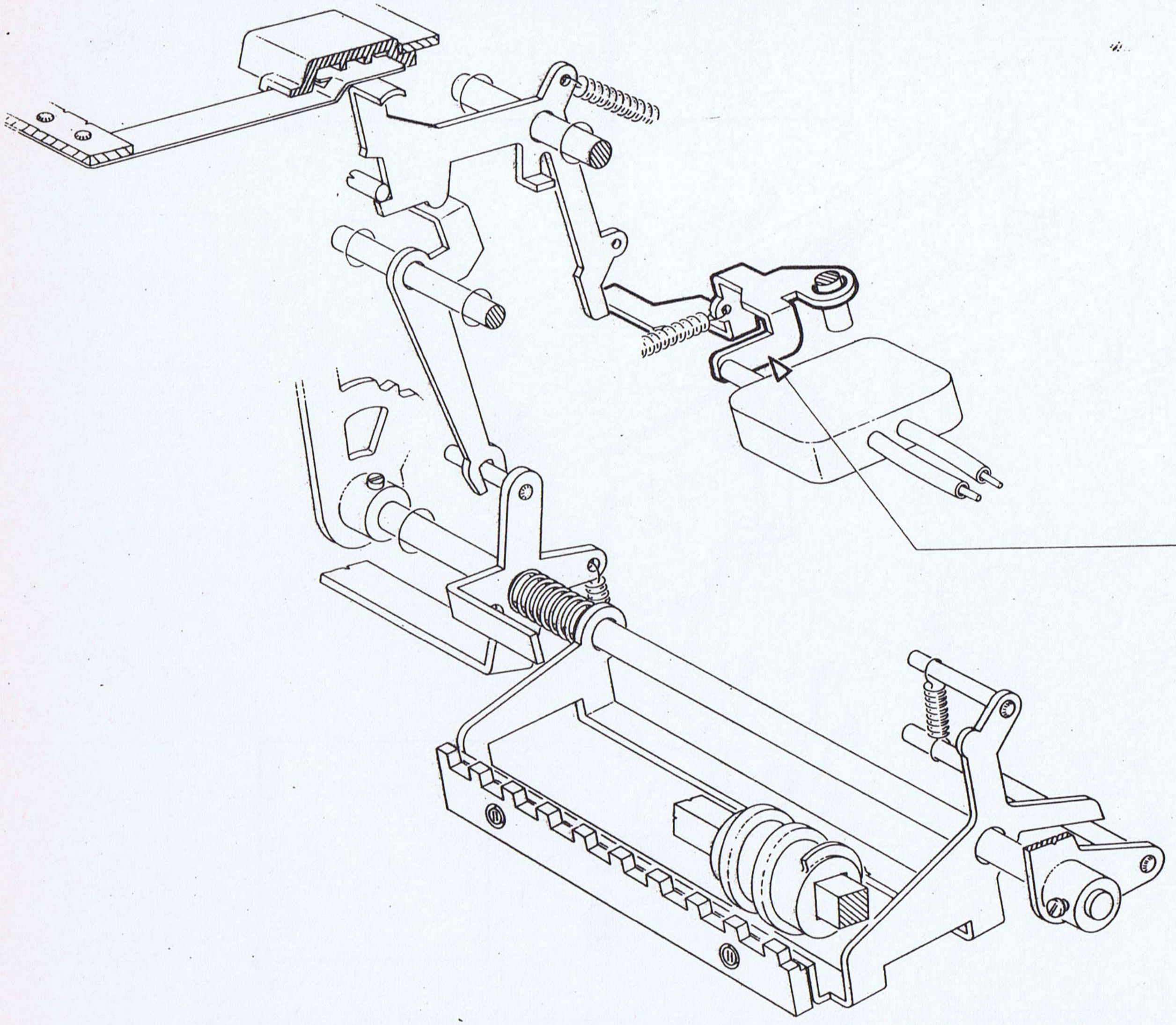
① E-28

②

③

ADJUSTING THE CLOSING OF THE MANUAL LINE SPACE MICROSWITCH

During the non line space cycles, the Microswitch must be open.



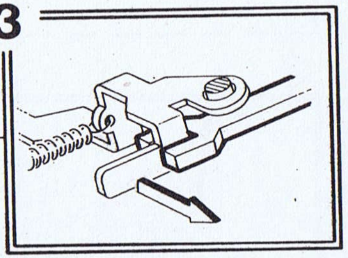
NOTE: Form in the direction of the arrow only if the motor does not run.

1

2

make certain
that the motor
does not rotate

3



E-28→①

②

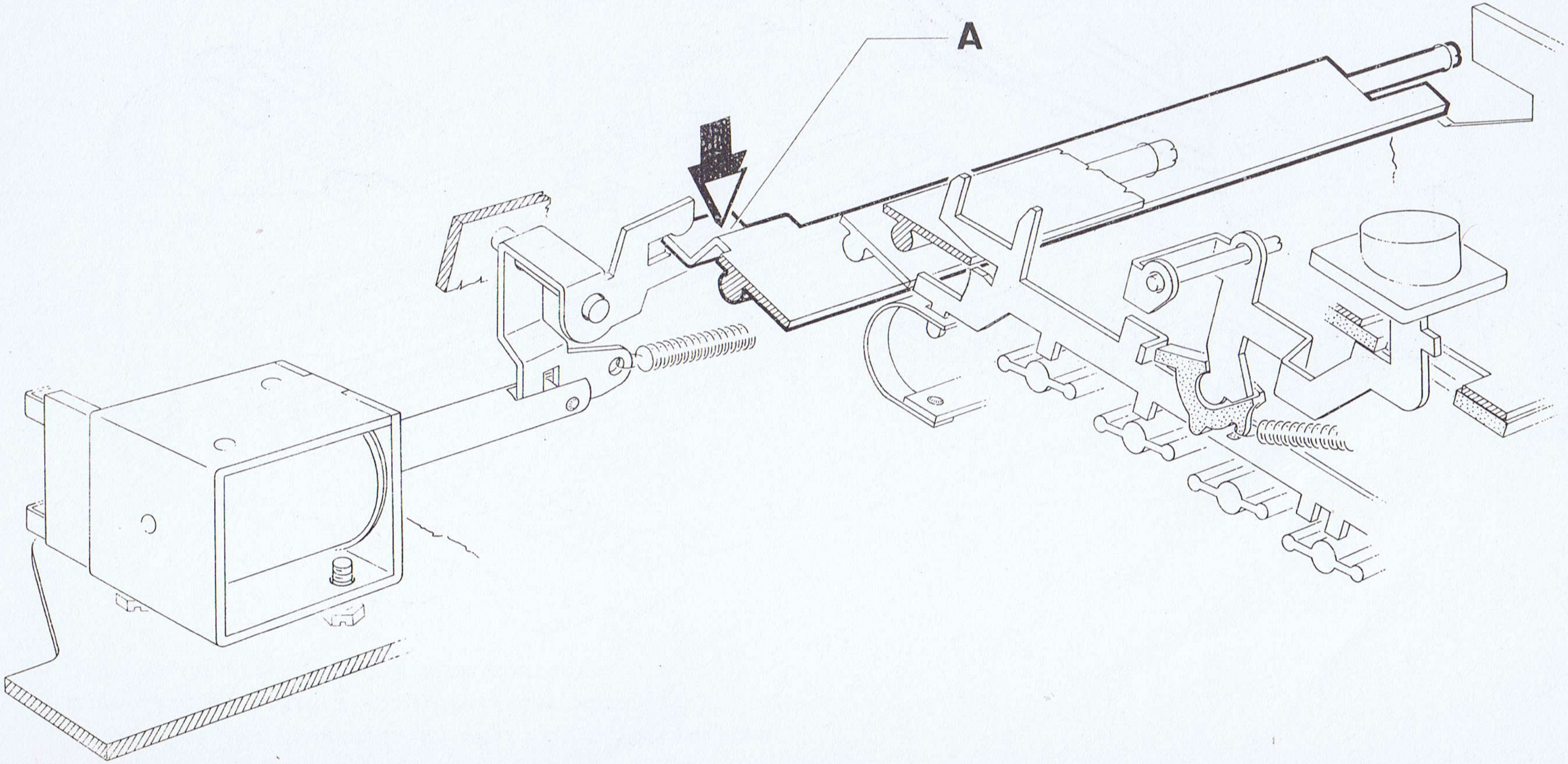
③

Section Z
PROCEDURES

MANUAL RELEASE OF THE KEYBOARD

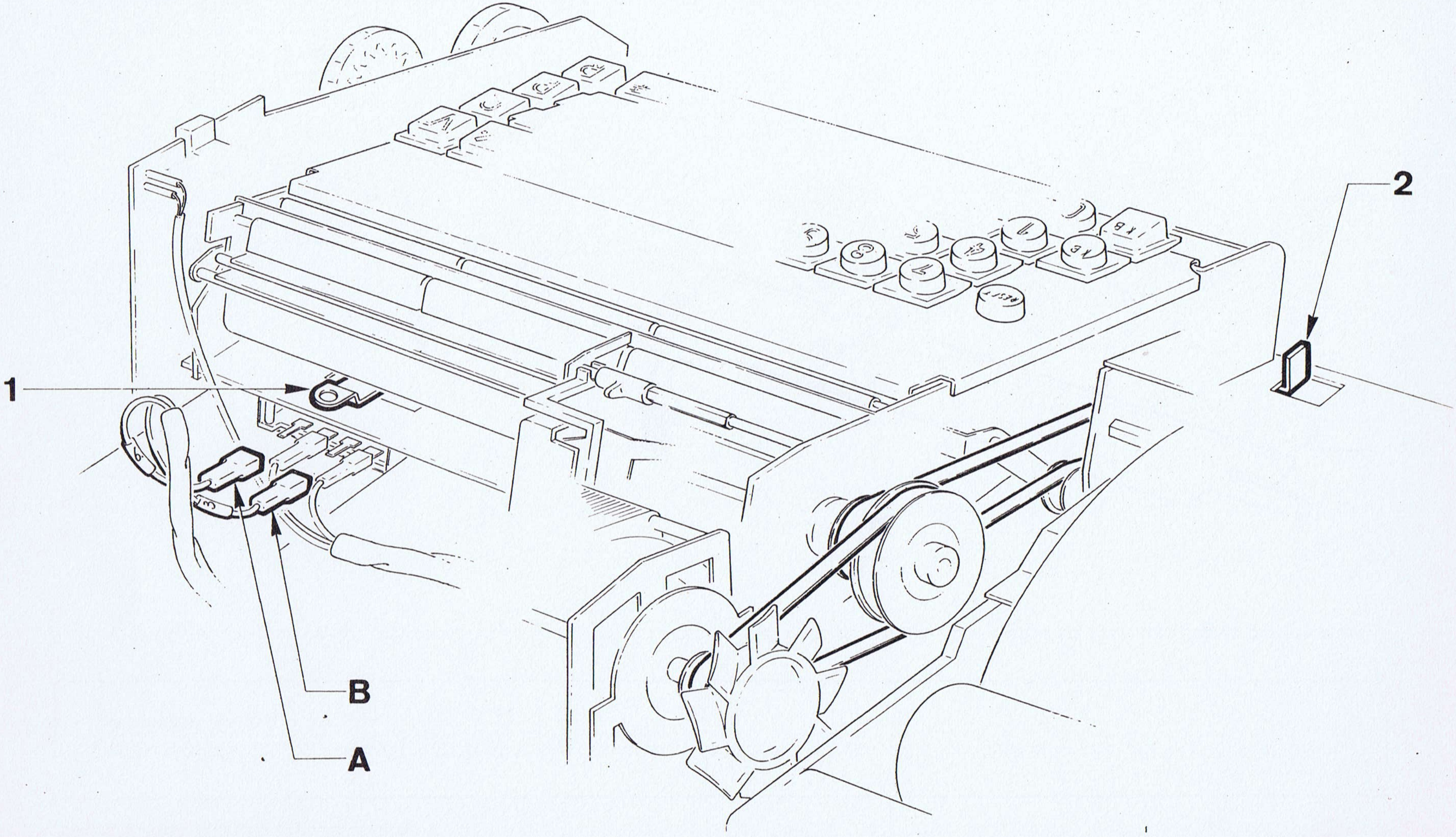
It is necessary to manually release the keyboard in order to be able to depress the keyboard key when the power is off.

The operation consists in keeping wing A of the locking bail down until the desired key has been depressed.



REMOVAL OF THE KEYBOARD

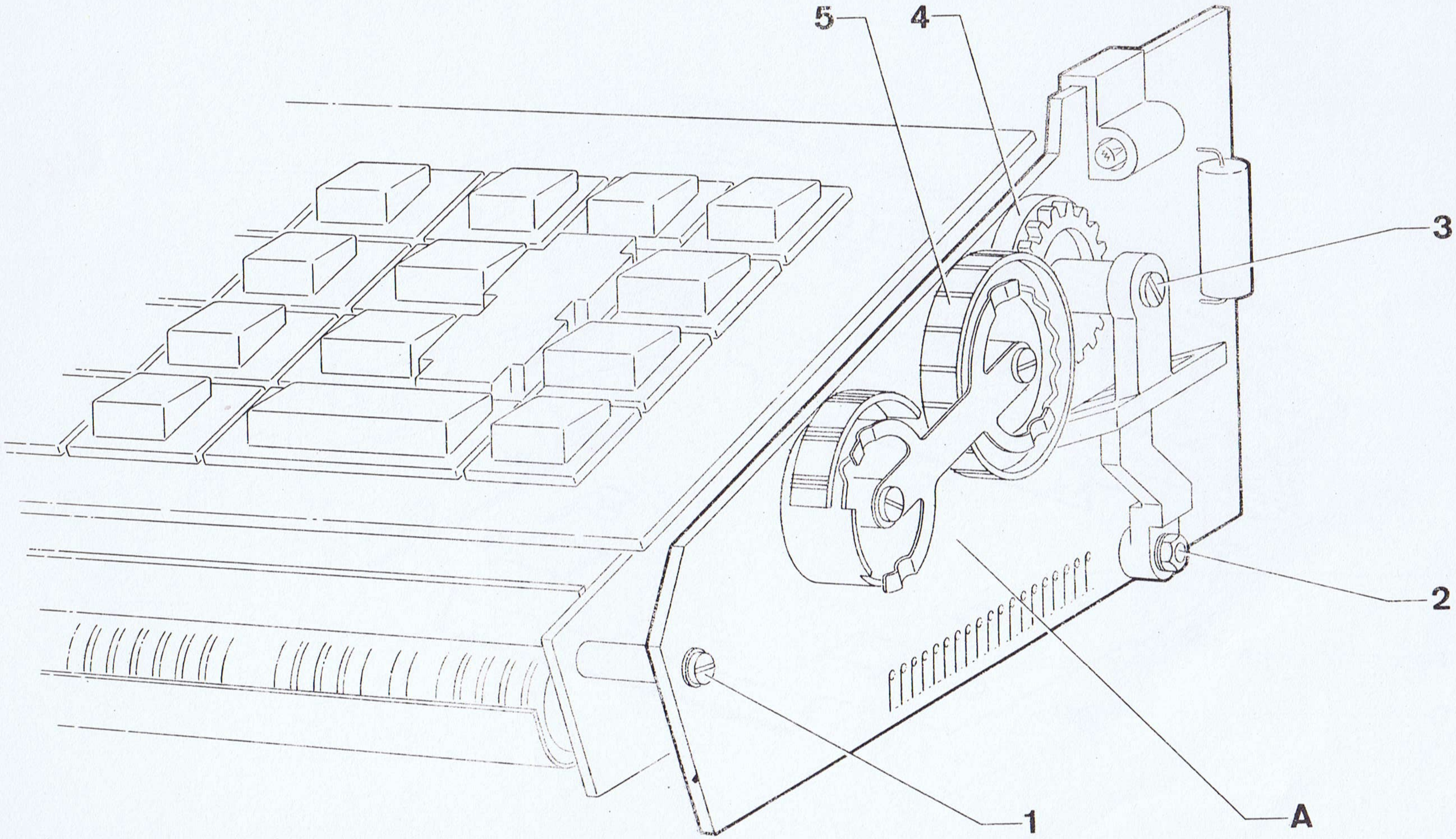
To remove the keyboard unit it is necessary to:
- remove the two transmission belts from the pulleys
- move latches 1 and 2 completely leftward
- disconnect wires A and B from contacts



NOTE: To reassemble the keyboard unit it is advisable to immediately position the front belt on the belt stretcher. Also be careful not to invert the position of the wires A and B.

REMOVAL OF THE REEDSWITCH BOARD

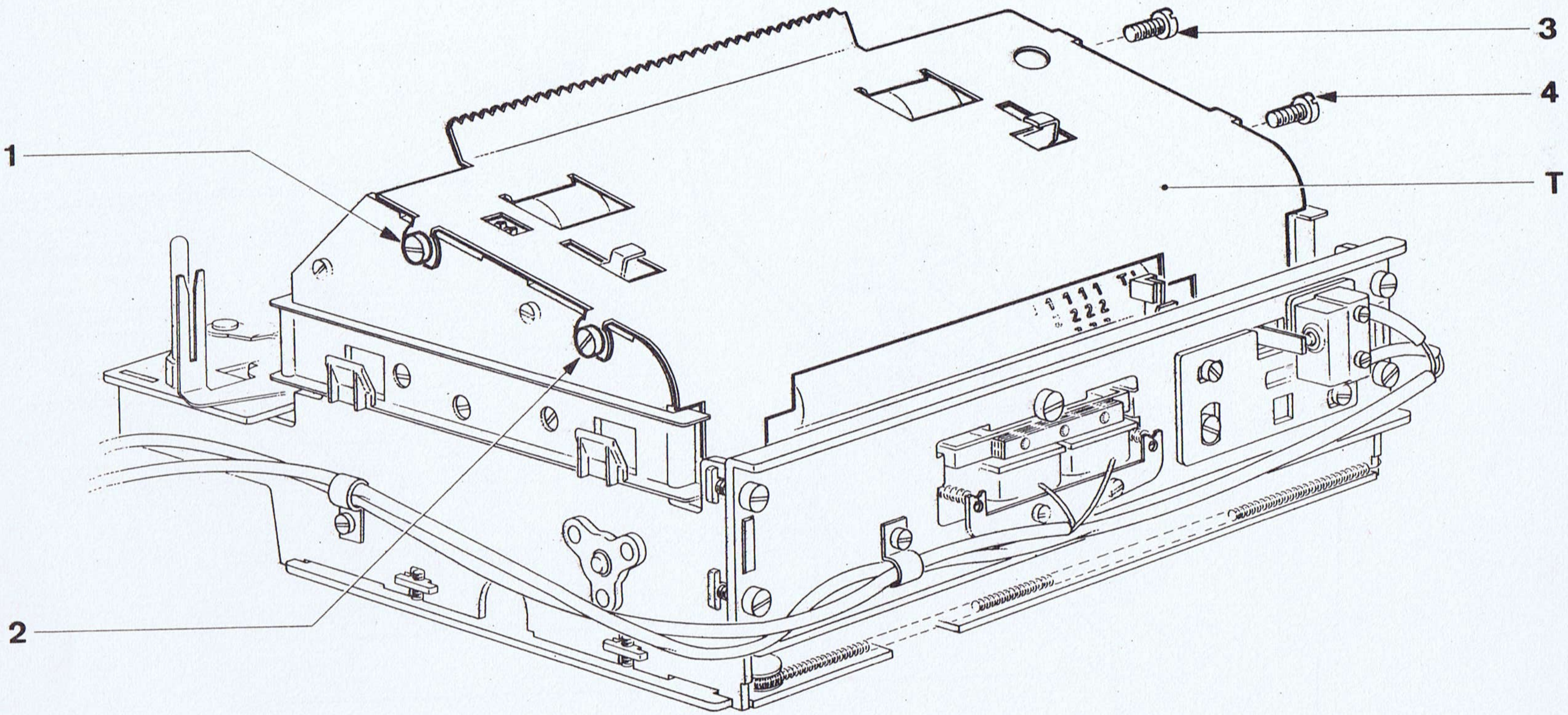
To remove Reedswitch Board A, it is necessary to unscrew: screw 1 and nut 2 (with washers), then screw 3. Pay attention not to change the timing between wheels 4 and 5.



NOTE: The removal of Reedswitch Board A is possible only if the keyboard is already disassembled.

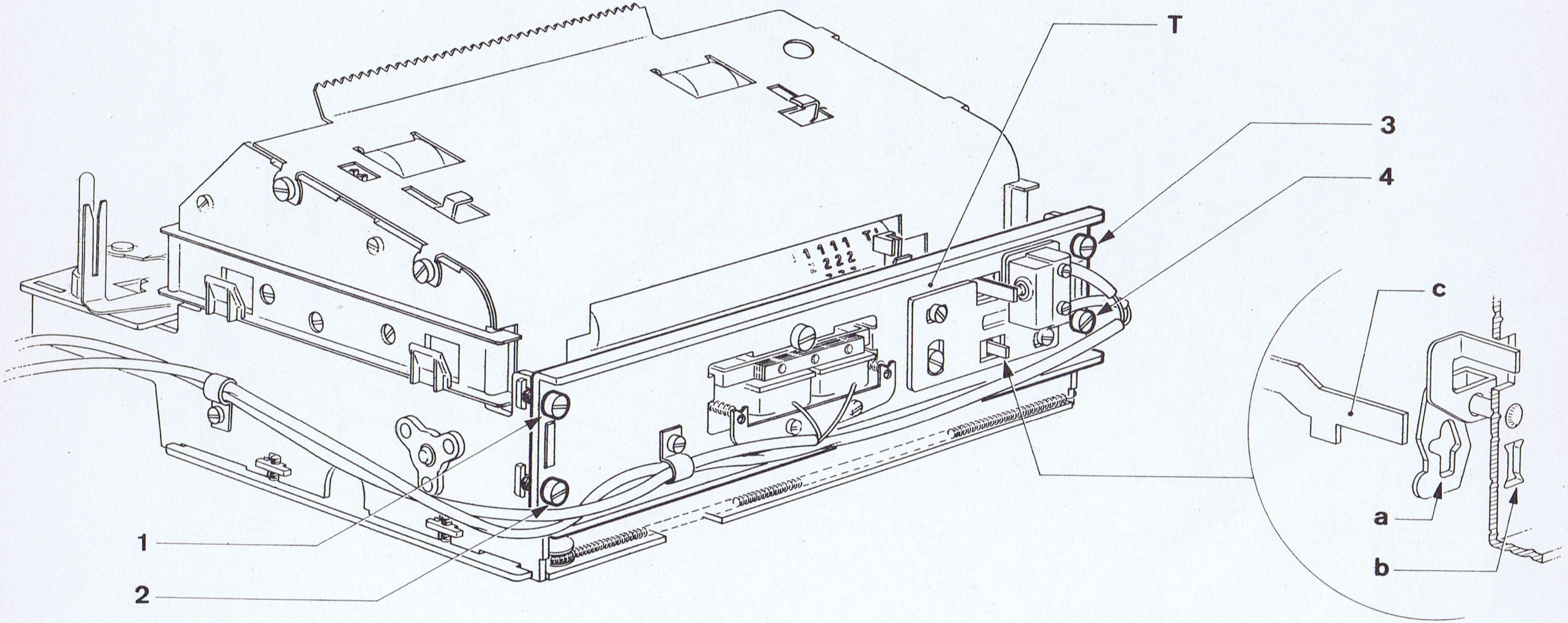
REMOVAL OF THE PAPER CUTTER

To remove paper cutter T, unscrew screws 1, 2, 3 and 4.



REMOVAL OF THE AW PLATE

To remove plate T, unscrew screws 1, 2, 3 and 4.



NOTE: Reassembling plate T, link c must be inserted in opening a and slot b.

REMOVAL OF THE PRINT UNIT

To remove the print unit screws 1, 2, 3 and 4 must be removed:
- screws 3 and 4 can be removed after having raised cover A
- screw 1 can be removed after having moved carriage B leftward.